Participatory Rural Appraisal (PRA) for Agricultural Research at Aruppukottai and Paiyur, Tamil Nadu

Department of Agricultural Economics
Centre for Agricultural and Rural Development Studies
Tamil Nadu Agricultural University
Coimbatore

and

International Institute for Environment and Development
London

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FOREWORD

India has made notable success on the agricultural front during the past four decades. Due to planned development our country has gained the ability to manage and overcome adverse conditions like drought and flood. However, in view of differences in resource endowment, there exists inter-regional, inter-sectoral and inter-class differences in development. Though good progress was noticed in different sectors of the economy, what was expected in planned development, ie. participation of farmers, could not be achieved. Hence, most of development programmes have remained as Government initiatives.

The State Agricultural Universities have taken the major responsibility of technology innovation and transfer to meet the challenges of the states as well as for the upliftment of the farming community. Though the location specific problems are identified by the scientists in different ways, *Participatory Rural Appraisal* is the latest technique developed for farmer participation in problem identification and research planning. The two workshops conducted for the scientists of Tamil Nadu Agricultural University at Aruppukottai and Paiyur have created much enthusiasm and interest among the scientists of the various disciplines in interaction with the farmers to know their needs and plan their research accordingly. I am sure that the present publications based on the two workshops conducted at Tamil Nadu Agricultural University will serve as a guideline for all those involved in research planning for the upliftment of the rural poor.

The grant provided by the Ford Foundation to the Centre for Agricultural and Rural Development Studies, Tamil Nadu Agricultural University, which enabled us to organise these workshops, is greatly acknowledged.

S. Jayaraj
Vice-Chancellor
Coimbatore - 641 003

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1. PARTICIPATORY RURAL APPRAISAL: A PERSPECTIVE

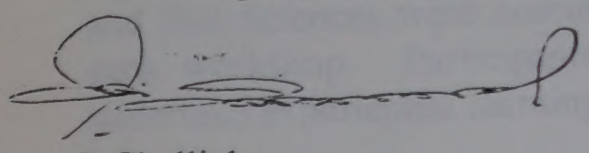
Dr S Chelliah

The challenges of the growing demand of agricultural commodities to meet the food needs and the raw material needs of the country are to be achieved through planned development of agriculture. This work is carried out mainly by the State Agricultural Universities. Tamil Nadu Agricultural University prepares and carries out research programmes in various disciplines to meet the challenges of the State. Currently the state of Tamil Nadu is divided into seven agro-climatic zones and location specific research is carried out. To know the problems of the farmers of each zone, the University has Regional Research Councils which provide the needed feed back to the researchers to plan their research. Similarly the Scientific Workers' Conference, which is a meeting of the staff of Development Departments and the Scientists, helps in interaction with each other to plan for future.

By this process, TNAU is able to plan its research programmes to meet the requirements of the farmers of the various regions. Similarly, the social scientists are also carrying out surveys to analyse the resource endowments, input use efficiency and the scope for better use of resources. These studies also help the researchers to plan their programme. But one limitation of such surveys is time.

There is a growing realisation that it is necessary to understand and appreciate the traditional technologies and the resource endowments of farmers so as to make research programmes still more effective in solving the problems of the farming community. Similarly, it is also necessary to involve the farmers themselves in understanding their problems and focus their needs. Participatory Rural Appraisal is an answer for all the above issues. This approach involves a team of inter-disciplinary scientists in looking at the problems of villagers in totality with farmer participation. Similarly the philosophy of Participatory Rural Appraisal makes the scientist as a learner from the village community. This method also helps in removing the feeling of 'outsider' in the minds of the farmers. The informal approach of collecting information through participatory processes helps the scientist to know more about the village in a short time rather than the interview schedule approach.

I am glad that the two workshops on *Participatory Rural Appraisal* conducted for the scientists of TNAU created a lot of interest among them. I am sure that this will act as one more sharper tool in understanding the farm problems and framing the research programmes.



S Chelliah
Director of Research
Coimbatore - 641 003

2. TNAU PRA WORKSHOPS: AN OVERVIEW

K C John and S R Subramanian

Researchers from Indian State Agricultural Universities adopt a range of institutional mechanisms that aid in identifying farmers' problems as well as framing their research programmes. Tamil Nadu Agricultural University embraces processes like Scientific Workers Conferences, Regional Research Councils, Zonal Workshops, Social Scientists' field studies, etc. in obtaining feedback on problems encountered by farmers that need immediate solution. These methods though useful in providing access to farm problems did not envision collaboration with farmers in understanding the field problems and translating prioritized problems into research programmes.

Participatory Rural Appraisal (PRA) is one of the emerging methods that enables the active participation of farming community in not only data generation but also in analysing their own environment - both ecological and socio-economic. Scientists, through the use of a menu of exercises, learn to appreciate the farmers' world-view and their problems. In addition, a multi-disciplinary team comprising agro-biological and social scientists interact with the farmers.

Tamil Nadu Agricultural University convened two PRA workshops at Regional Research Stations Aruppukottai and Paiyur during December 1991 for providing its researchers with a hands-on experience with a suite of participatory techniques. The main objectives of the workshop were:

- to develop an understanding of the importance of participatory appraisal concepts, methods and approaches in appreciating the ecological and socio-economic context that influence farmers' decision-making;

- to develop skills in working in multi-disciplinary teams with inter-disciplinary concerns; and

- to examine the implications of developing a research programme that is sensitive to the socio-economic and ecological context of the farming family.

Scientists belonging to disciplines like Agricultural Economics, Agricultural Engineering, Agricultural Entomology, Agricultural Extension, Agronomy, Plant Breeding and Genetics and Soil Sciences were nominated to the workshop. Some thirty scientists participated in each workshop. Participants were assisted by resource persons (see Appendix D) to undertake experiential learning.

The learning strategies during the workshop included a mix of presentations from resource persons, practice sessions in small working groups, buzz sessions to reinforce learning themes, intense collaborative interactions in three selected villages to learn farmers' analysis of their environment, critical reflections, reporting back findings and identifying gaps in understanding. Plenary sessions helped in developing checklists of issues for exploring with

farming community and for consolidating group work results in the form of village case studies. A multi-media approach, involving print materials, slide-tape shows, and video tapes, was employed to supplement the learning objectives.

As a sequel to the workshops, participants developed action programmes to be implemented at their respective research stations. The follow-up action consisted of a seminar on PRA and a series of parallel diagnostic exercises in the seven agro-climatic zones of Tamil Nadu.

A village representative of the farming system of the respective agro-climatic zones was selected for the parallel PRA in the second round. A team of multi-disciplinary researcher exposed to the PRA methods participated in collaborative learning with the farming community in the seven villages. The team visited the villages several times to learn from farmers about their perspective, employing methods like mapping, transect walks, ranking, seasonality analyses, resource flows, venn-diagrams, etc. The village case studies, besides reporting the findings of the exercises, also enumerate farmers' problems that await researchers' attention. A whole gamut of indigenous technologies and traditional knowledge about farming practices that are ecologically sensible was also identified. The reports will serve as an important document containing the farmers' need for technological solution under specific farming system conditions.

The outputs from the second round of parallel exercises will be fed into a Research Program Planning Workshop that is scheduled in the second half of August 1992. The third round of exercise will have, besides representatives from PRA exercises, research managers and senior researchers as participants. They would review ongoing research projects in the wake of emerging findings of the diagnostic exercises in different agro-climatic zones and reformulate the TNAU research agenda. More specifically, the objectives of the Research Programme Planning workshop are:

- to review the outcome of farmer participatory diagnostic studies in the different agro-climatic zones of Tamil Nadu;
- to identify the core problems to be addressed by the research programmes; and
- to develop a systems framework for planning agricultural research programme.

The PRA workshops conducted in December 1991 have generated a system-wide ripple-effect in the Tamil Nadu Agricultural University. Subsequently, it is expected that more farmer-responsive research programmes would be initiated that would be effective in solving important farming problems in different agro-climatic zones.

Plate 1. Participatory map of Aruppukottai Regional Research Station made by agricultural scientists
Photo: Jules Pretty

Plate 2: Participatory map of Aruppukottai Regional Research Station made by agricultural scientists
Photo: Jules Pretty

Plate 3. Participatory map of Paiyur Regional Research Station made by agricultural scientists
Photo: Jules Pretty

Plate 4. Participatory map of Paiyur Regional Research Station made by agricultural scientists
Photo: Jules Pretty

PARTICIPATORY RURAL APPRAISAL FOR AGRICULTURAL RESEARCH, AT ARUPPUKOTTAI, TAMIL NADU

Edited by
R Vijayraghavan, S R Subramanian, Jules N Pretty & K C John

With contributions by members of three field teams

Appanaikenpatty Village
M Manoharan
T N Balasubramanian
P Parameswaran
R Shantha
B Subbalakshmi
S Kuttalam
M Chandrasekaran
J Devavaram
B R Bhat

Kalkurichi Village
S Subramanian
N Kempuchetty
D Ananthakrishnan
S Muralikrishnasamy
C Jayanthi
K Renganayaki
Jules N Pretty
R I Jayakaran

Meenakshipuram Village
R Vijayaraghavan
N Gopalaswamy
K Mohanasundaram
K Velayudham
R Ventikaswamy
S Geetha
P Sauthri
Vijay Kumar
K C John

Department of Agricultural Economics,
Centre for Agricultural and Rural Development Studies
Tamil Nadu Agricultural University, Coimbatore

International Institute for Environment and Development, London

1992

3. PRA OF APPANAICKENPATTY VILLAGE IN KAMARAJAR DISTRICT

M Manoharan
T N Balasubramanian
P Parameswaran
R Shantha
B Subbalakshmi
S Kuttalam
M Chandrasekaran
J Devavaram
B R Bhat

1. Overview of the Village

Appanaickenpatty village is one of the 59 revenue villages coming under Virudhunagar block of Virudhunagar taluk in Kamarajar district. It has two hamlets, namely Gopalapuram and Mallaya Naickenpatty. This village is located on the southern side of Virudhunagar town on Sathur - Palavanathm road at a distance of 18 km from Sathur. The PRA team had a planning session on the responsibility of each member and a sub-contract was entered into to share each of the methods learnt by individual members. On the first day the PRA team got acquainted with the village situation and the people. The team had already spent a morning analysing secondary data, developing a team contract (by using the Problem Solving Exercise) and producing the first interview guide and checklist of key topics.

The team contract was as follows:

- *group leader will be nominated*
- *we will be conscious of everything farmers say*
- *we will arrive for work on time*
- *all of us will listen not lecture*
- *we will stick to our own rules and regulations*
- *we agree to change assignments*
- *at the end of everyday we will agree to meet and discuss findings.*

2. Participatory Mapping

On the first day the PRA team got acquainted with the village situation and the people by meeting them at the roadside shops, houses and on the transect walk through the fields. This enabled the team fully to explain the purpose of the visit, and to make arrangements for the mapping the next day. This also helped the PRA team develop rapport with the villagers. On explaining the purpose of the mapping, Mrs.Seethammal came forward to draw the village map. Others soon joined with her. As a tree was obstructing the mapping, they moved to anew site. While the team silently watched the process, triangulation took place (induced as well as natural) and corrections were made by the local people. Rangoli powder was used for mapping.

They took about four hours to complete the colourful mapping. The villagers who gathered around were identifying their houses and made suggestions to alter some places here and there. The school children rushed to the spot after the schooling hour was over and they also participated enthusiastically. Two boys who took interest and initiative copied the drawing onto two large sheets of paper, one for the team and one for themselves. The PRA team stayed overnight in the village and had lengthy and detailed discussions with the villagers, relating to health, economic factors, silviculture, agriculture, animal husbandry, land development, irrigation, etc.

FIGURE 1

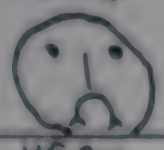
APPAIYA NAICKAN PATTY
SOCIAL SETTLEMENTS
NAIC KERS
Scheduled caste
Pu La vars
Thevars
Asari
Asari

3. Wealth Ranking

Mrs.Ramammal helped in depicting the wealth ranking of the village. Later Mr. Vellai, a young man, joined and started drawing the rough village sketch and located the houses on the map. The team asked them to specify the names of the heads of each household, and the numbers of people in each. As soon as this process was over they were asked to identify the people according to their wealth as rich, middle and poor. One local person retorted *"we are all poor"*. After further discussion, in which other local people helped in the explaining, the exercise proceeded. After a fairly long discussion they depicted the various households. But then they said the scheduled castes are not even in the poor category, and so made a 4th class. There were 28 households in the wealthiest class, owning wetland, conducting business and/or with a member working abroad. Those 10 households in the poorest class had no land, no animals except pigs, and are thus casual labourers.

FIGURE 2

WEALTH CLASSIFICATION

CLASS	CRITERIA	NUMBER &(%)
RICH	Owners of wet land more than 10 acres or dry land about 25 acres (or) Doing business (or) working abroad or any combination of these.	28 (23.70)
MEDIUM	Owners of wet land between 2 and 10 acres, match workers, Skilled labourers and Govt. employees.	28 (23.70)
POOR 	Owners of wet land less than 2 acres, match workers, Skilled labourers, Govt. employees.	52 (44.00)
VERY POOR	People having no lands no assets, no animals except pigs, who are casual labourers with poor housing & low edn.	10 (8.60)
	Total :	118 (100.00)

4. Social Factors

The demographic information was represented by means of pie diagrams drawn with rangoli powders. There are 11 castes, dominated by the Naikar community.

Name of Caste	*Number of Households*
■ Naikars	44
■ Asari	14
■ Thevar	16
■ Pulavar	18
■ Kudimaiyan	5
■ Nadar	1
■ Achali	2
■ Pillai	5
■ Chettiar	2
■ Semman	1
■ Scheduled Caste	10

The PRA team visited the scheduled caste colony which was located on the southern corner of the village. Most of them did not have any land. They always seek employment from the land owners of the village. But because of the competition for work with labourers from neighbouring villages, they could find only very little work here. They had tried pig farming, but it had failed for want of resources and local demand for pig meat. Some do cobbling and sweeping. Children work in the match factories, but do not go to school for want of clothes and money for books. There was no power supply to their houses.

5. Venn Diagrams for Local Institutions

The PRA team met the men and women and requested them to list out the institutions of local importance. The entire process was explained to them by cutting pieces of paper and placing them on the ground. This method was tried separately with men and women villagers. They listed the institutions according to their perceived importance. The priorities differ for men and for women.

Institutions	*Men's Priority*	*Women's Priority*
■ Shandy	1	1
■ Water tank	2	2
■ Higher secondary school	3	4
■ Co-operative society	4	3
■ Teacher training school	5	13
■ College	6	8
■ Police station	7	5
■ Primary school	8	9
■ Agricultural Extension Service	9	-
■ Primary health centre	10	7
■ Ration shop	11	6
■ Panchayat office	12	10
■ Post-office	13	14
■ Palvadi	14	11
■ Siddha hospital	15	15
■ Veterinary hospital	-	12

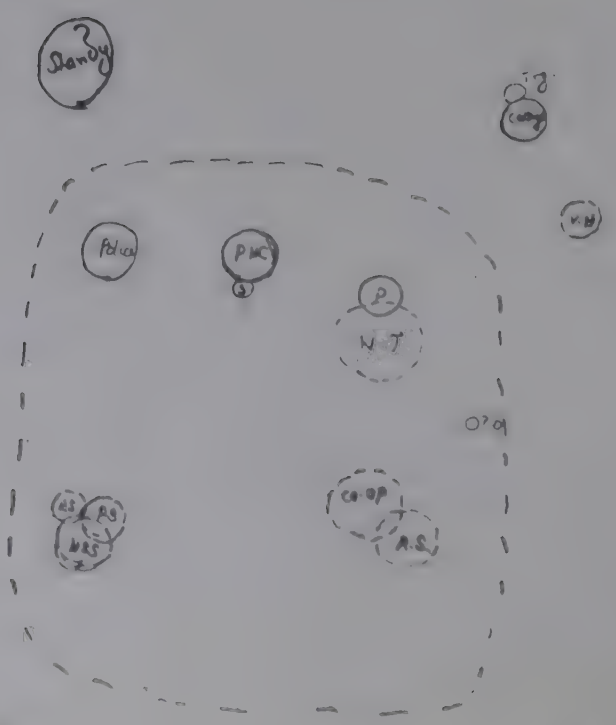
Both men and women indicated the necessity of Shandy market as the first priority followed by the Water tank. Men placed more importance on the extension service, which the women did not mention.

FIGURES 3 & 4

Venn diagram - Men
.... local importance

H.S. Higher secondary School
P.S. Primary school
B.S. Balwadi
PHC - primary Hlth. Centre.
S. Siddha hospital.
co-op. Society
R.S. Rationshop.
W.T. water tank.
P. Panchayat
Agri. Dept. agriculture
P.O - Post office.

Venn diagram - Women
..... Local importance.

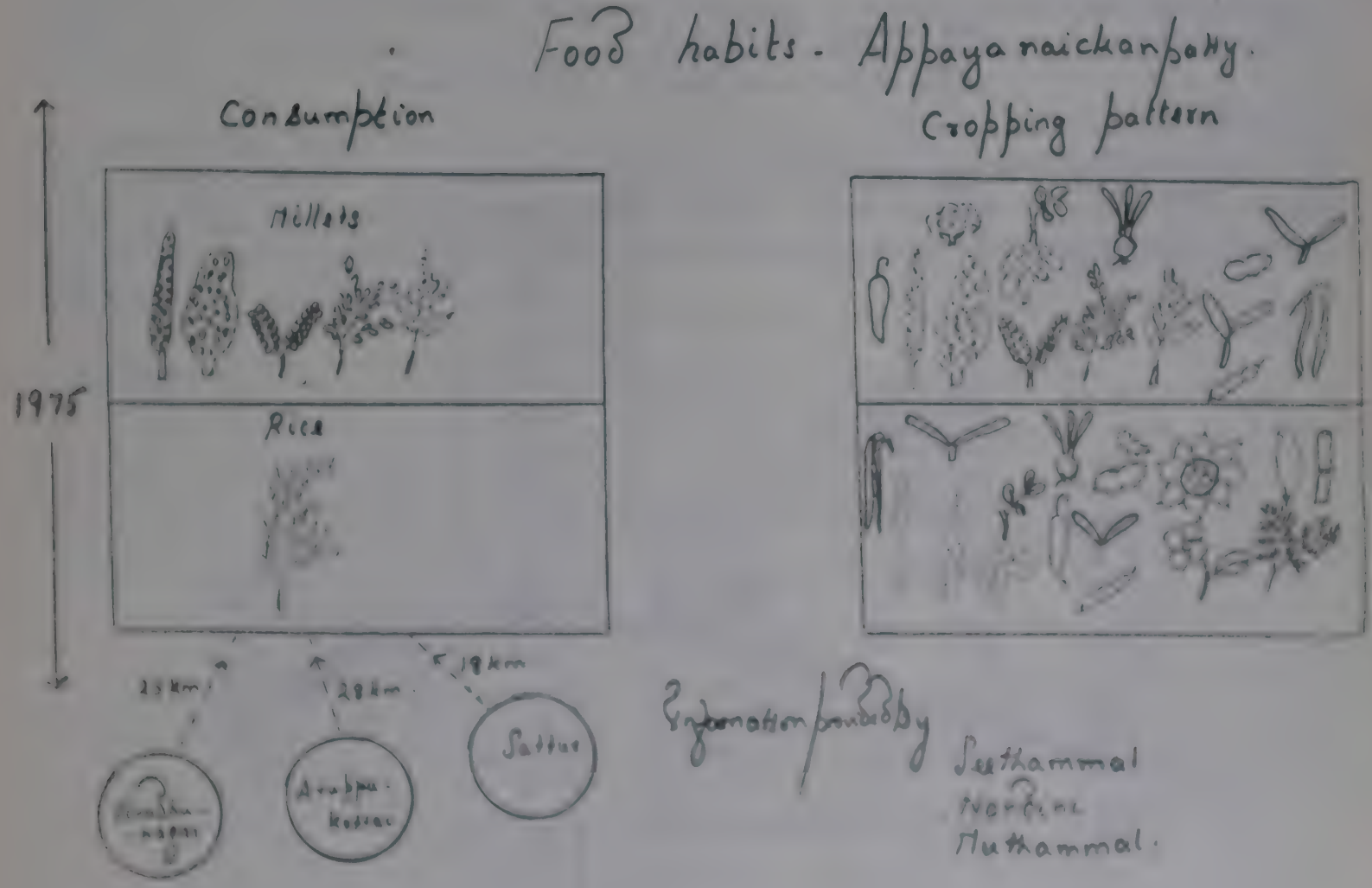


P O post office
V.H veterinary hospital

6. Time Line on Food Habits

When the PRA team went around the village, several women of different age groups were found pasting match boxes. Initial rapport was established and they were requested to draw some illustrations on the ground about their food habits. An old lady of about 70 years Mrs.Muthammal, told that when she was young she used to eat lot of finger millet, pearl millet and other minor millets. They were more healthy than the subsequent generations. She observed a slow and steady change in the food habit. Now everyone eat rice only because eating of rice is a social prestige, millets are to be processed before cooking and the time spent on culinary purposes could be utilised for working in the match factory. The food habits were illustrated on the ground by the village women with help of ear heads, grains, etc. It is interesting to note that rice is not grown in the village and they purchase it from a long distance.

FIGURE 5



7. Historical Profile of the Village

The PRA team during the course of investigation contacted Mr.T.Ramamoorthy, a retired school teacher. He narrated the historical profile of the viliage. The village came into being even before 1900. In 1947, there were 80 households and about 50 pairs of work bullocks. While the number of houses increased to 90 during 1956 and 120 during 1990, the number of bullocks remained at 50 up to 1959. Then it gradually declined to 40 during 1960, to 35 during 1962 and finally just 4 in 1990.

As regards other social overheads or infrastructure, a police station, a water tank and a high school were started during 1959. Opening of a Siddha Medical centre and provision of drainage system were done during 1960. One elementary school was opened in 1962, while the co-operative credit society was commissioned during 1963, and the post-office in 1970. A building for panchayat board office came into being in 1972-73. The Co-operative milk society started during 1975 was closed in 1985 as the membership of the society dwindled. Three match factories started functioning in 1978 and now there are 12.

FIGURE 6

HISTORICAL PROFILE OF

APPAYANAICKEN PATTI. VIRUDHUNAGAR TK.

YEAR	INSTITUTIONS DEVELOPMENT	No of Houses	No of Bullock pairs
1947	–	80	50
1956	–	90	50
1959	POLICE STN.(1) OVER HEAD TANK(1) HIGH SCHOOL (1)		50
1960	DRAINAGE PROVISION SIDDHA HOSPITAL (1)		39
1962	ELEMENTARY SCHOOL (1)		35
1963	PRIMARY CO. AGRL. CREDIT SOCIETY (1)		30
1970	POST OFFICE (1)		26
1972–'73 1975	PANCHAYAT OFFICE (1) Co-op. milk Society (closed 1985)		20
1978	MATCH FACTORY (3)		15
1980	MATERNITY CENTRE (1)		10
1990		118	04

EXPECTATIONS

* ESTABLISHMENT OF VETY. HOSPITAL
* ESTABLISHMENT OF AGRL. SUB. DEPOT
* ESTABLISHMENT OF SHANDY

INFORMANTS: THIRU.T.RAMAMOORTHY

8. Transect Walks

On reaching the village, the PRA team contacted one shop woman in that village and requested her to name four or five farmers of the village. From the list of farmers obtained the team went to a house and got introduced by specifying the objectives of the visit. Since he was an educated farmer after ascertaining necessary facts from the team, he asked his son to call some more nearby farmers for discussion. We discussed various matters for an hour. The team then expressed its wish to have a walk across the village to understand the topography, crops, soils, etc. After getting their acceptance, the team was divided into two groups and had a transect walk. Mr.Kasirajan, Gurusamy, Gannakaom and Thangapandian were the farmers met on the way and discussed.

The first group started its walk in the south direction and the second started towards north. The village and its cultivable area is positioned in two sub watersheds. There are red soils (*semman*), clay loams (*vellaithanai*), and vertisols (*kaisalman*). Most of the irrigated area is red soil and the major source of irrigation is open wells. There are no bore wells. Neem, Acacia, Teak, Albizzia and Prosophis were the trees observed during transect walk. In the red soil erosion of higher magnitude was observed. Chillies, cotton, onion, banana and teak are being raised under irrigated condition. Only 5 per cent of the clay loam soil area is under irrigation and the rest is rainfed. Cotton, blackgram, sunflower and fodder sorghum are raised under rainfed conditions. There are also serious erosion problems on the black soils.

The team found the transect walk very valuable for learning from the farmers accompanying them and those met on the way. Many problems were seen and explained first hand. The most pressing problems were soil erosion, poor water recharge to wells, and nutrient depletion in rainfed soils. The opportunities would appear to lie percolation ponds, bunding, and biological conservation measures.

FIGURE 7

9. Seasonality Analyses

Mrs.Seethiammal, Mrs.Pakkiam and Mrs.Padmavath prepared seasonal calender by drawing pictures to depict rainfall, crop ping pattern, labour demand and human & health problems. They used actual specimens of field crops i.e. grain for indicating the cropping pattern of their village. Tamil months were taken into account for arriving seasonal calender.

In the other group, Mr.Ramasamy and Mr.Chellappan were the informants to provide the necessary information on seasonal calender. They were given paper and pencil and were requested to indicate the points as per their perception. The information thus collected from both the groups were verified between the two groups. At this juncture about five farmers joined and offered suggestions and modifications to the pictures already drawn and by this the seasonal calender was finalised.

The villagers computed past rainfall for each month based on their own experience and their statements were not based either on actual quantity received nor rainy days observed. Their statements are directly based on months which receive lesser or higher rainfall. *Puratasi*(September 15th to October 15th), *Ipasi* (October 15th to November 15th) and *Karthegai* (Nov 15th to Dec 15th) were the months which received higher rainfall. The major farming problem was the erratic nature of the rainfall.

The rainfed cropping pattern differs markedly from the irrigated.

Rainfed Cropping Pattern: Normally farmers raise only one crop under rainfed irrespective of three soil types. Farmers adopt a fool proof contingency planning in respect of sowing of their rainfed crops. If the south-west monsoon is on the right set, ie. during *Adi* (July 15 to Aug 15) normally groundnut will be sown as a sole crop. In certain low marginal holdings, to avoid the risks, groundnut is sown along with intercrops like lab lab, cowpea etc. Some farmers with lower economic status sow green gram as a sole crop. If the monsoon rain is delayed and sets during *puratasi*, the farmers' normal practice is to sow cotton, sorghum, pearlmillet, and sunflower as sole crops. Some farmers sow black gram as one among the intercrops along with cotton. If the rainfall is further delayed to *Ipasi* (Oct 15 to Nov 15) they sow coriander, indigo and bengal gram. As a last sowing under rainfed, with the receipt of rain during *Karthesai* (Nov 15 to Dec 15) the normal tendency is to go for black gram, pearl millet (special local variety which tolerated dew).

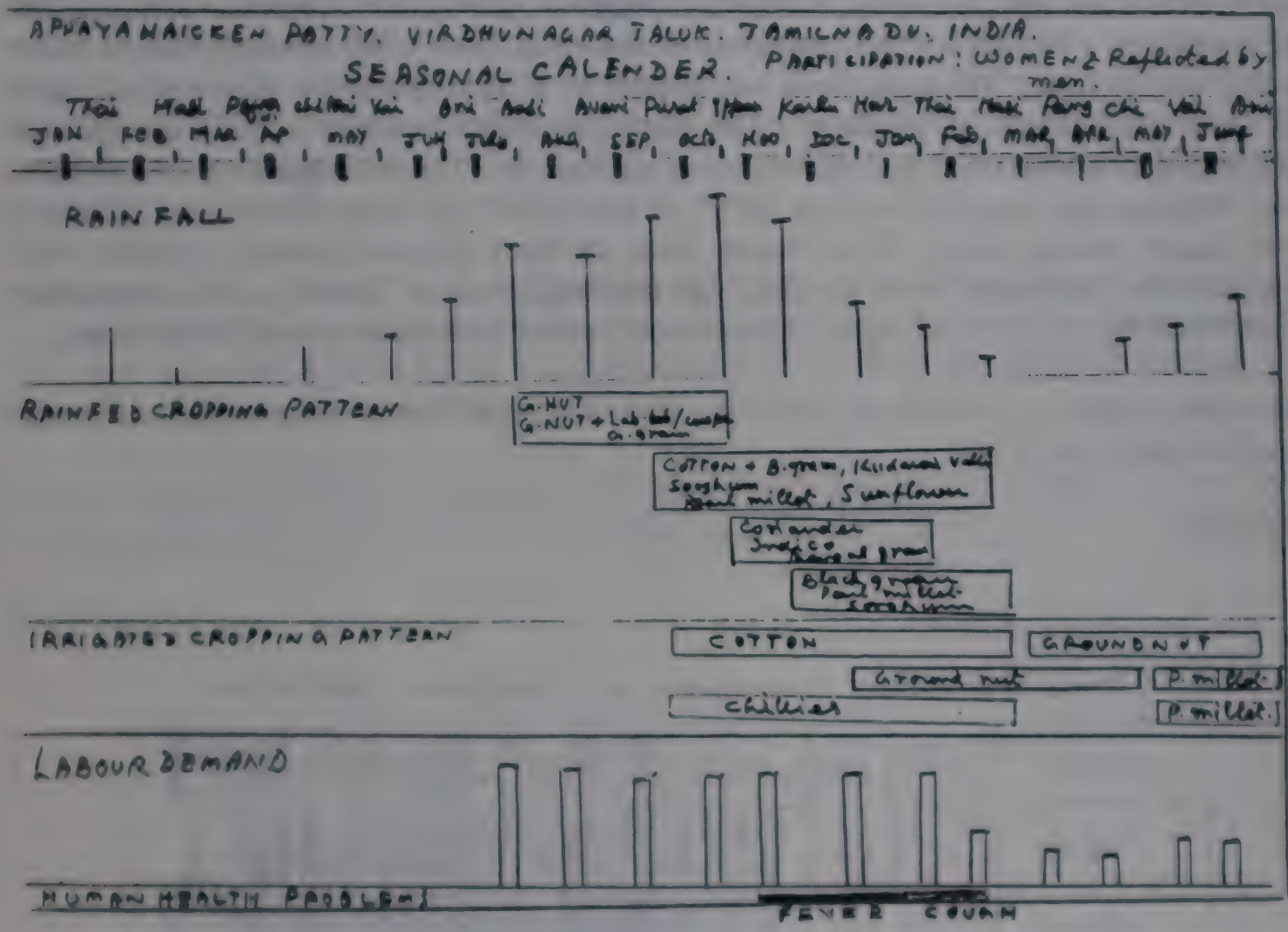
Irrigated Cropping Pattern: Three predominant cropping patterns are cotton (Puratasi) followed by groundnut (masi) groundnut (markazli) followed by pearl millet (chitrai) and chillies (puratasi) followed by pearl millet (chitrai). Due to poor recharge of ground water, cultivation of these crops are being threatened.

There is greater labour demand from *Adi* (July 15 to Aug 15) to *Thai* (Jan 15 to Feb 15) and thereafter it gets decreased. The increased labour demand is related to extensive cultivation of crops both under rainfed and irrigated areas. Since farmers do not use any labour saving agricultural implements other than their own country plough, they entirely depend upon labour force for carrying out their agricultural operations resulting in hike in labour wages.

From *Karthesai* (Nov 15 to Dec 15) to *Thai* (Jan 15 to Feb 15) both fever and cough are said to be the major health problems at their village.

The farmers were able to recall that there was cholera incidence during 1940 and thereafter no incidence was recorded. Similarly there was small box during 1950 and thereafter it was not recorded. Elephantiasis and plague are not observed from the time memorial. Presently four children are ailing with polio disease.

FIGURE 8



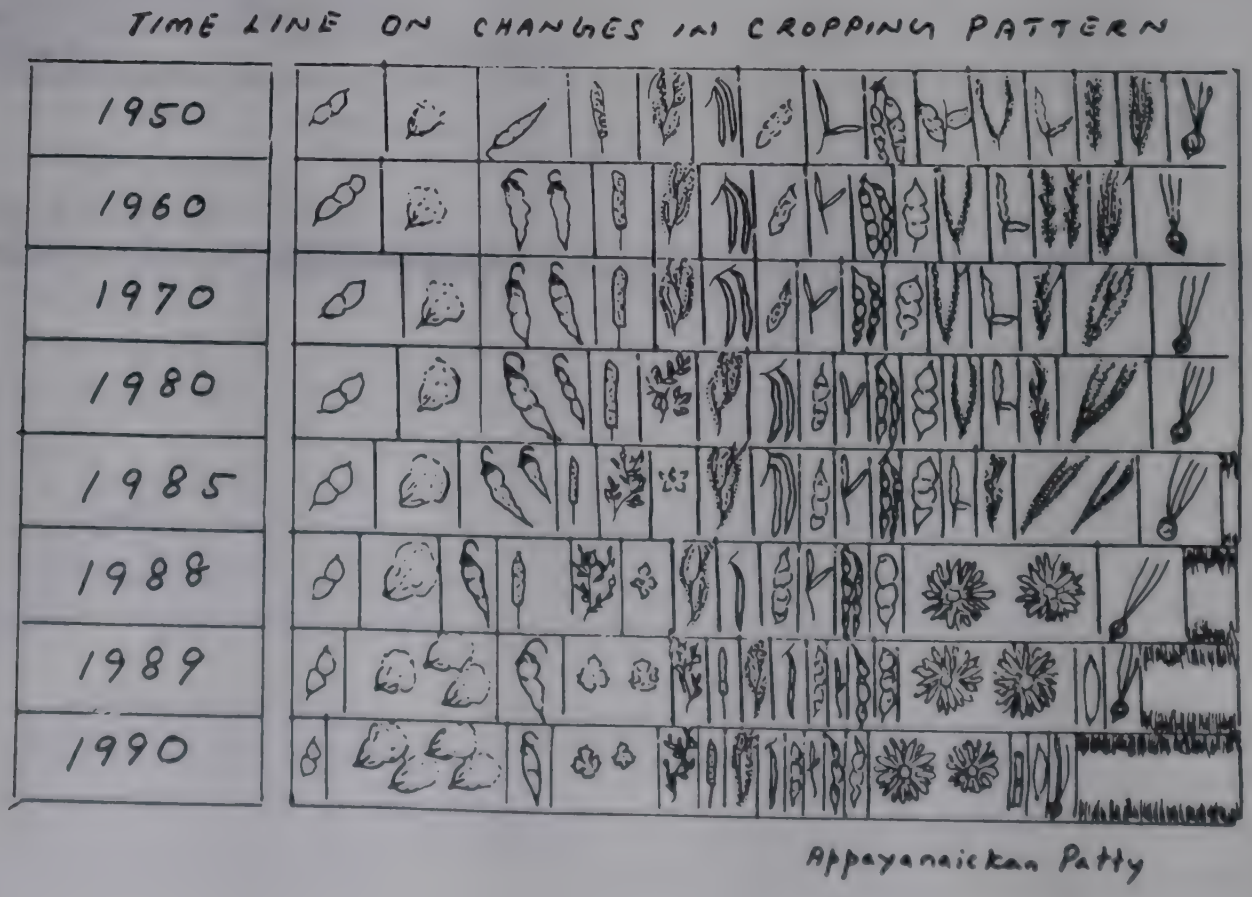
10. Timeline on Changes in Cropping Pattern

Mr.Ramamoorthy, Mr.Manickavasagam and Mr.Kurusamypulavar drew the time scale on cropping pattern on the floor of the Muppathamman koil and depicted with earheads, flower heads, pods, leaves and grains. When the PRA team approached Mr.Kurusamypulavar, he informed that he is residing in the village since 1972 and he brought the other two retired teachers for this time line drawing.

It is inferred that groundnut, cotton and chillies occupied nearly 40 % of the total cropped area in 1950's and rest by cumbu, blackgram, redgram, greengram, cowpea, varagu, lablab and vegetables. The area under groundnut is declining from 1980 onwards due to water scarcity and drought. The same trend was noticed in chilles, due to the high cost of inputs and white aphid attacks on seedlings. The starting of match factories in 1978 changed the job function of labourers, as they moved out of agriculture. The area under cotton increased from 1980 but they switched over to MCU 10 and LRA 5166 from Karunganni (Uppam) cotton due to market value. Even though there are more pest and disease problems with these varieties, they prefer them for their high marketable value. Recently, the introduction of sunflower by the Dept. of Agriculture attracted many farmers to switch to this crop.

The overall pattern is thus one of increasing diversity, even though some traditional crops have declined or been lost.

FIGURE 9



11. Historical Transect of Tree Crops

Three retired school teachers, Mr.Ramamoorthy, Mr.Kurusamy Pulavar and Mr.Manickavasagam were explained the purpose of having this exercise by the PRA team. Though they were hesitant first, they asked the school boys who returned home to draw the lines and they marked the area under tree crops by chalk piece. When the work was completed about ten village women came and some corrections were made following their suggestions. The transect study of tree crops in the village since 1950 indicated the stabilisation of neem, morinda, tamarind, coconut and vedhanarayan. These trees occupied almost the same area over a period of 40 years. A remarkable reduction was observed in *Acacia nilotica* and *Palmyra* trees. *Acacia* formerly grew in tanks, but this prevented access for bullock carts for transporting silt from the tank to the fields, and for deepening the tank. In 1980, the severe drought meant that the palmyra trees had to be cut down for sale. The introduction of *Prosophis* as a fence crop was observed from 1970. It is a quick growing source of fuel.

Since the advent of industrial developments, such as the match factories and cotton textile industry, there has been an increased demand for labour. Farmers and labourers are increasingly preferring tree rather than field crops, so that they can combine farming with industrial labouring.

Farmers suggested *Ailanthus excelsa*, silk cotton and soobabul as useful for the match industry, and teak, *Acacia*, neem and tamarind as good agroforestry trees.

FIGURE 10

12. Matrix Scoring: Dryland Tree Selections

The role of agroforestry was explained to the farmers under dryland conditions. They were explained of its merits and re quested to offer their views. The farmers actively participated and gave their views on different tree crops, their value and income. After discussion they were requested to quantity their ideas through matrix scoring. Mr.Ramamoorthy took the drawing of lines with colour chalk on the floor. The criteria taken were low initial input, quicker growth, possibility of intercropping, timber value, fuel value, drought tolerance and net income. Twigs of different trees with leaves were placed in horizontal columns with the criteria written in vertical columns. The quantification was done with tamarind seeds. The highest overall scoring was for *Prosophis* and this was attributed for its quick growth even under drought.

FIGURE 11

VILLAGE: APPAYA NAICKEN PATTY.

TREE / CRITERIA	PROSOPHIS	ACACIA	NEEM	TEAK	TAMARIND
LOW INITIAL INPUT	●●●●●	●●●●	●●●●	●●●	●●●●●
QUICKER GROWTH	●●●●●	●●●	●●●●	●●	●
INTERCROPPING		●●	●●●	●	●●●●
TIMER VALUE		●●●	●●●●●	●●●●●	
FUEL VALUE	●●●●●	●●●●	●●		●●●●●
DROUGHT TOLERENCE	●●●●●	●●●●	●●●	●●●	●●●●
NET INCOME	●●●●●	●●	●●●	●●●●●	●●●●●
SCORE	25	22	24	19	24

DAYLAND TREE SELECTION MATRIX RANKING CONSTRUCTED BY FARMERS OF APPAYA NAICKE -PATTY VILLAGE.

FARMERS HAVE CHOSEN THEIR OWN CRITERIA AND QUANTIFIED THROUGH TAMARIND SEEDS

13. Matrix Scoring: Cotton Varieties

There was a small group discussion among the farmers regarding the varietal preference in cotton. They unanimously expressed a preference for LRA 5166. So they were requested to display the merits and disadvantages of the alternative cotton varieties through a matrix scoring exercise on the ground. They selected drought tolerance, tolerance to pests, tolerance to pests and diseases, reddening of leaves (magnesium deficiency), yield of kapas, net return and easy marketability as the criteria for the matrix ranking. They collected the actual plants for display as specimens. The quantification was done by using white gravel pebbles.

Though Karunganni varieties were not under cultivation, they gave the scoring from their previous experience. It was given the highest scoring for drought tolerance followed by LRA 5166 with the same ranking. Karunganni was also more tolerant to aphids, bollworm infestation, and disease attack. But LRA 5166 scored far better for yield and net returns.

FIGURE 12

COTTON VARIETY / CRITERIA	KARUNKANNI	L.R.A 5166	MCU 10
DROUGHT TOLERENCE	●●●●●	●●●●●	●●●●
TOLERENCE TO APHIDS	●●●●●	●●●	●●●●
TOLERENCE TO BOLLWORM	●●●●●	●●	●●●●
TOLERENCE TO Mg. DEFICIENCY	●●●●●	●●●●	●●●
TOLERENCE TO DISEASES	●●●●	●●●	●●●
YIELD OF KAPAS	●	●●●●●	●●●●●
NET INCOME	●●	●●●●●	●●●●
MARKETABILITY	●	●●●●●	●●●●
SCORE	28	32	31

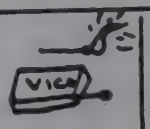
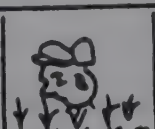
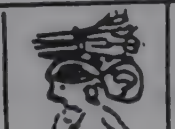
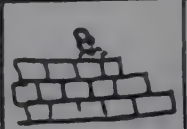
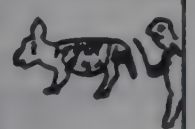
COTTON VARIETAL PREFERENCE MATRIX RANKI
CONSTRUCTED BY FARMERS OF APPAYA NAICKE
-PATTY VILLAGE.
FARMERS HAVE CHOSEN THEIR OWN CRITERIA AND QUANTIFIED THROUGH PEBBLES.

14. Matrix Scoring for Employment Preference

The farmers used materials like match box, crop samples, hand hoe, kolluru and sheep driving sticks to indicate the livelihood options. The criteria selected were annual income per person, employment potential, easiness of work, and health. Stone pebbles were used for scoring. The overall scoring with respect to earning was highest for mason/carpenter followed by match factory work and sheep rearing. Once again, match factory scored poorly on health aspects.

FIGURE 13

EMPLOYMENT PREFERENCE BY VILLAGERS

Employment Category / Criteria					
Annual Income per person	✡✡	✡	✡	✡✡✡✡✡	✡
Employment Potential	✡✡✡✡	✡✡✡✡	✡✡	✡✡✡	✡✡✡✡✡
Easy to do	✡✡✡✡✡	✡✡	✡✡✡	✡✡	✡✡✡
Health	✡✡	✡✡✡✡✡	✡✡✡✡✡	✡✡✡✡	✡✡✡✡
Total Score	13	12	11	14	13

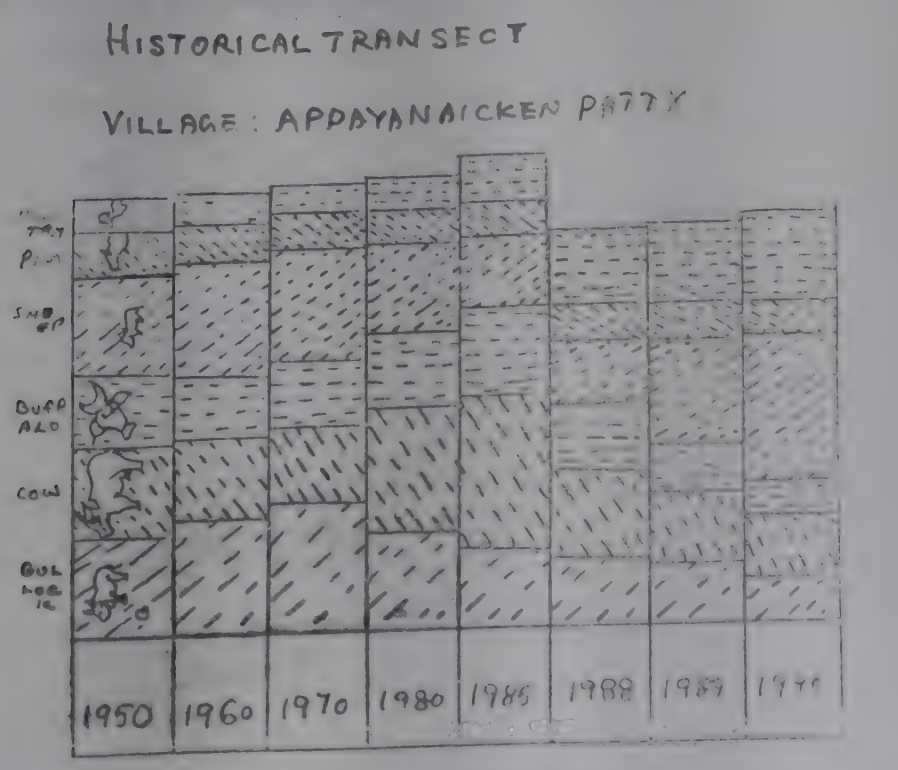
APPAIYANAICKANPATTY

15. Historical Profile for Animals and Poultry

The PRA team on seeing a person tending a sheep enquired in detail about his work. He was from the Yadava community, who are the main rearers of sheep. Most of the animals belong to the Naicker community. He receives wages in kind (grain), working from 7am to 6pm. In the meantime some more villagers also joined the discussion. The team explained the purpose of historical transect and relevant procedures. They used the natural events to represent animals. The animals and birds selected by them were bullock, cow, buffalo, sheep, pig and poultry. They took 1950 as the base year since they could recollect the information from memory only from that year only. They consulted among themselves and drew the transect on the ground. The drawing was seen by about 50 people of the village which constituted men, women and children. The key findings were:

- Bullocks: people of the village observed increasing trend between 1950 and 1980 and thereafter decline in the number of animals till 1990.
- Buffaloes and cows: there was an increase from 1950 to 1985 and the number reduced thereafter due to the closure of cooperative milk society. Further the fodder availability was also reduced.
- Sheep and Goats: there was no change in the number of animals up to 1985. Afterwards an increasing trend was seen.
- Poultry: there was an increasing trend from 1985. Most of the families have birds apart from the two poultry units in the village.

FIGURE 14

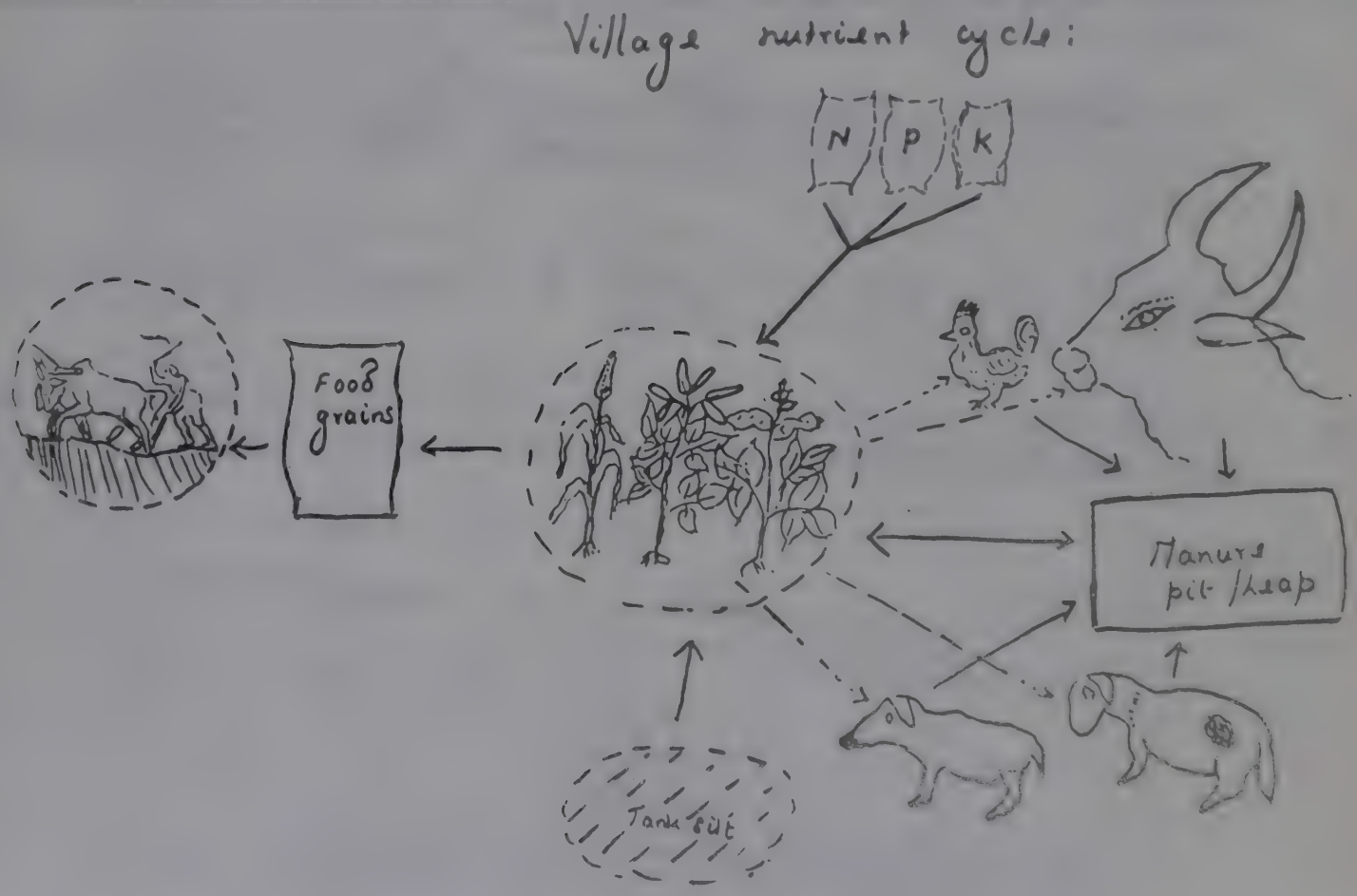


HISTORICAL TRANSECT FOR ANIMALS AND BIRD.
DRAWN BY VILLAGERS OF APPAYA NAICKEN

16. Village Nutrient Cycle

The PRA team observed that no farmer was able to complete the village nutrient cycle. For cultivation of crops farmers do not apply nutrients as per the recommended level. Based on their experience they established their nutrient management system for each crop. This level is well below the recommended level. But they do integrate inorganic fertilizers with organic manures. The share of inorganic is about 40% as compared to 60% organic manure application. Tank silt and transported black soil also form another source of nutrient applied to field crops. The harvested foodgrains are consumed locally and marketed outside. The haulms of field crops are utilised as livestock feed and hence recycling is observed.

FIGURE 15



17. Documentation of Local Innovations

- *Morinda* menace: Morinda comes up very well on its own in the vertisol. But this is a problem during sowing operations under rainfed condition. Farmers don't want to eliminate morinda totally because it supplies fuel for their home needs. They dig a pit of two feet depth around morinda shrub and cut the stem of the shrub to ground level. Subsequently they peel the bark of the stem very close to root and apply common salt and cover the cut ends with coconut shell and then the entire pit is covered with soil and thus allowing the shrub to die. This local technology resulted in better control of morinda.

- When chillies are cultivated continuously for more than two years farmers could not harvest satisfactory yield from chillies. To ameliorate this malady, farmers apply tank silk after two continuous crops of chillies. They also transport black soil.

- Wilting of rainfed crops: Two ploughings are conducted during the summer months before the normal sowing and ploughing. This results in better moisture conservation without any significant run off loss. The soil moisture conserved is able to support the dry land crops up to 20 days from the receipt of rain during crop growth period. By only ploughing during sowing, dry crops suffer and wilt after 10 days from the receipt of rain.

- Sucking pest problem in cotton: neem seed kernel powder is mixed with dimethoate and sprayed on cotton to control sucking pests. It is more effective than dimethoate spray alone.

- White ant problem in nursery: solution of neem leaves boiled in water and then cooled applied around nursery effectively stops ants.

18. Farmers' Perceptions of Opportunities for Integrated Farming Systems

The villagers listed out the following enterprises as suitable for a system approach.

1. Silviculture
2. Poultry Farming
3. Sheep rearing
4. Farm forestry

They explained that the available vast fallow land can be used for silviculture. The elevated terrain which gives a dry environment is suitable for poultry farming. The availability of pasture land, dry environment, man power, and instability of crop production under rainfed conditions can be shifted to sheep farming. They informed that farm forestry is also possible by growing tree crops in rainfed areas.

- Agri-Horti-Silviculture mix proposed by farmers:

In years of adequate rainfall with suitable soil and moisture management practices the following crops could be raised:

1. Cotton
2. Groundnut with suitable intercrops
3. Grain cum fodder Sorghum.
4. Pulses
5. Cumbu
6. Chillies
7. Indigo
8. Vetiver for soil conservation (Whenever necessary)

- Match Industry related activity: the plantations of ailanthus, silk cotton, subabul, etc. supply the required wood materials for the match industry.

- Livestock related (sheep) activity: *Leucaena, Acacia, Vedanarayanan* and *Pithocolobium dulce* provide feed for sheep and goat besides supplying wood for fuel and industry.

- Agroforestry: the tree crops like teak, acacia, neem, tamarind etc. were suggested by the villagers for agro-forestry.

- Horticulture: the farmers suggested that fruit trees like *ber, anova, sapota & jamun* can be raised.

FIGURE 16

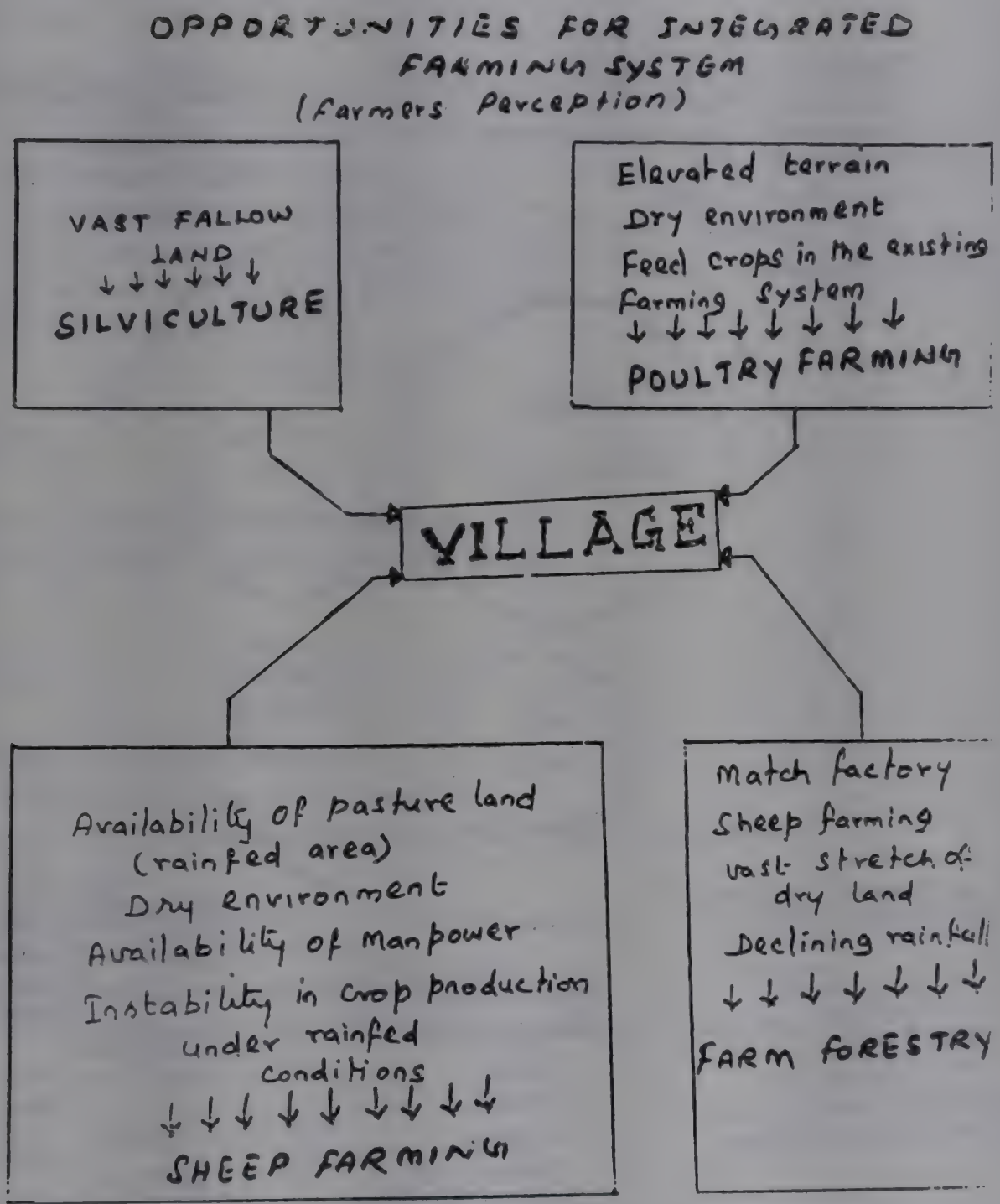

OPPORTUNITIES FOR INTEGRATED FARMING SYSTEM
(Farmers Perception)
VAST FALLOW LAND
SILVICULTURE
Elevated terrain
Dry environment
Feed crops in the existing Farming System
POULTRY FARMING
VILLAGE
Availability of pasture land (rainfed area)
Dry environment
Availability of manpower
Instability in crop production under rainfed conditions
SHEEP FARMING
Match factory
Sheep farming
vast stretch of dry land
Declining rainfall
FARM FORESTRY

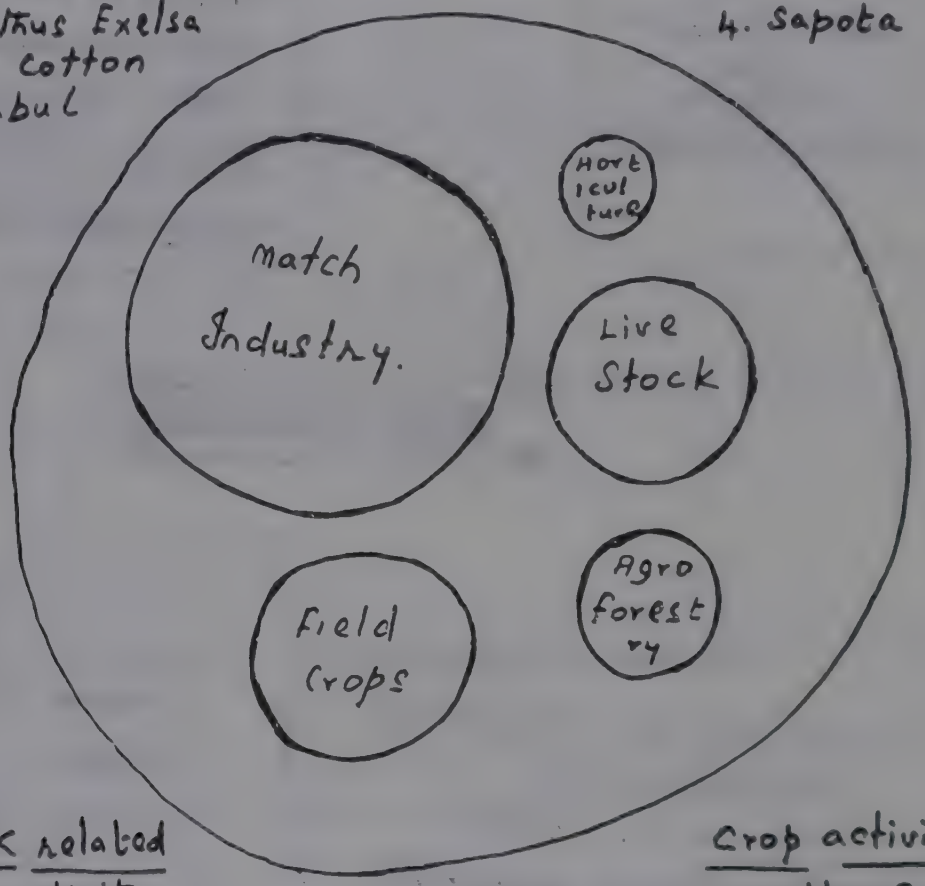
FIGURE 17

PROPOSED AGRI-HORTI-SILVICULTURAL MIX.

Match Industry Related Activity:

Plantations of:
1. Ailanthus Exelsa
2. Silk cotton
3. Soobabul

Horticultura
1. Ber
2. Anona
3. Jamun
4. Sapota



Live Stock related (sheep) activity
Plantations of:
1. Leucaena
2. Acacia
3. vedhanarayan
4. Pithacolobiumdulce
5. Albezzia lebbec.

Agro-forestry
Plantations of:
1. Teak
2. Acacia
3. Neem
4. Tamarind
(inter-crop with Pulses, fodders)

Crop activities
1. cotton } with inter crops
2. G. nut }
3. Sorghum - grain-cum-fodder
4. Pulses
5. Indigo
6. vinca rosia
7. cumbu
8. Chillies
9. vettiver for soil conservation.
10. brion, 11. coriander

APPAIYA NAICKEN PATTY

20. Identification of Problems, Responses and Opportunities

The PRA team and local farmers identified extension gaps, research gaps, social issues and policy issues. This led to a consideration of a model for analysisng these problems.

Extension Gap

- White aphid, muranai mite and fruit rot in chillies
- trees for industries, wasteland management, livestock
- Magnesium deficiency - cotton
- improper selection of irrigated crops
- moisture conservation practices - lacking
- poor utilisation of agricultural implements
- improper tank mix

Research Gap

- banana chocking, tip rotting and skin split
- identification of potential parasites of teak

Social Issues

- under utilisation of dryland
- exploitation of scheduled castes
- lack of organised association for youth, women and farmers
- village taboos
- poor marketing facilities
- disrespect to dignity of labour
- cultivation only in the hands of aged farmers
- poor economical resource for irrigating, poultry, sheep rearing

Policy Issues

- drinking water
- proper drainage
- hospital/veterinary hospital
- catchment area degradation
- increase in fallow
- periodicity of power supply
- completion of kollar patté dam.

Problem 1: Increase in fallow land with decline in rainfall under rainfed conditions

How did we learn it was a problem? This problem was identified through PRA practice at the village at different stages. The stages of identification are i) during the drawer of the time scale of cropping pattern of this village and land use pattern ii) during the transect walk of the village and iii) group discussion with farmers.

Who are affected by this problem? Marginal farmers of the village. This accounts to more than 80% of the farming community.

How long been problem? In the increase in area under fallow is observed from 1985 onwards, and presently the area under fallow threatens the food productivity of that village.

Where is it a problem? Rainfed areas of Black and Red soils, where the decline in annual rainfall is observed. Sometimes due to the heavy rain storm, soil erosion will become a major factor responsible for the problems.

Farmers' responses and achievements: From the interaction with the farmers it is learned that some farmers grow *Catharamthuons sosias* and indigo which are said to be suitable for marginal soils value moisture storage is questionable one.

Options for Research:

1. It needs group action
2. Keeping the lands fallow should be discouraged as drought tolerance is easily lost, and high value crops of short duration and proven moisture conservation capacity should be tested on farmers' fields;
3. Further screening of suitable trees may be done for sustainable agriculture.

Problem 2: White aphids and mite menace in chillies

How did we learn this was a problem? This problem was identified through the following process:

- transect walk
- farmers discussion
- field visit
- drawing a diagram on crop diversification.

Who is affected by this problem? The chilli growers of irrigated red soil lands which amounts to more than 50 acres.

How long been this problem? This problem was observed by the farmers during 1985 and this seriously was greatly felt between 1988-89. Due to this problem, in addition to reduction in fruit yield the area under this crop also got reduced.

Where is it a problem? Red Soil areas where farmers grow chilli in their cropping system. Due to lack of knowledge farmers did spray with the advice got from the local pesticide dealers and spraying contract man of that village. Improper tank rust also one among the

factors responsible for this problem. These have aggravated the problem to a larger magnitude.

Farmers responses or achievements: After seeing the seriousness of the problem most of the chilli farmers have gone for raising the nursery for selling the seedlings to the villager outsiders further the interaction wit the farmers revealed that there is a greater need of technology development for this menace at village level.

Options for Research: Even though many technologies available for these problems that were worked out based on single component approach, the present problem is with multiplicity of mites, white aphids and fruit rot. So one location specific research programs shows to be drawn to tackle these problems at a time by integrating cultural, biological and chemical materials in a programme of integrated pest management.

4. PRA OF KALKURICHI VILLAGE IN KAMARAJAR DISTRICT

S Subramanian
N Kempuchetty
D Ananthakrishnan
S Muralikrishnasamy
C Jayanthi
K Renganayaki
Jules N Pretty
R I Jayakaran

1. Overview of the Village

The PRA team decided to practice the exercise at Kalkurichi village in Kariapatti Panchayat Union of Aruppukottai taluka in Kamarajar District. A handout consisting of a brief description of Kalkurichi village was handed over to team members in advance for an overview of the village. From the secondary data the following information was derived by the PRA team:

- Kalkurichi village is one among the 38 revenue villages of Kariapatti Panchayat Union.
- The village is located at 12 km from Aruppukottai on Madurai - Aruppukottai main road.
- The village has about 850 households with an average family size of six.
- The population is largely *Devanga Chettiar*, followed by *Naickers*, *Thevar*, *Nadars* and *Harijans*.
- The average annual rainfall is 813 mm. April and May are the hottest months recording maximum day temperature of 42° C. During January the temperature falls below 18° C.
- The village is characterised by gentle slopes accessible to all types of tropical crop cultivation.
- The village is densely populated with a human population density of 728 per square km.
- In respect of infrastructure, the village has good black topped road connecting the towns of Madurai, Aruppukottai and Virudhunagar.
- The village roads are mostly mud roads crossed in between with open drainage channels.

- The village has a hospital, panchayat union office, overhead water tank, handloom societies, match factories, rice mill, cinema theatre, bank, fair price shop, and middle school.

- The soil is predominantly black with calcareous patches.

- The crops grown are rice, cotton, sorghum, pearl millet, greengram, black gram, chillies, tomato, groundnut, and sunflower.

- The villagers are mostly dependent on weaving, agriculture, match industry, and trading.

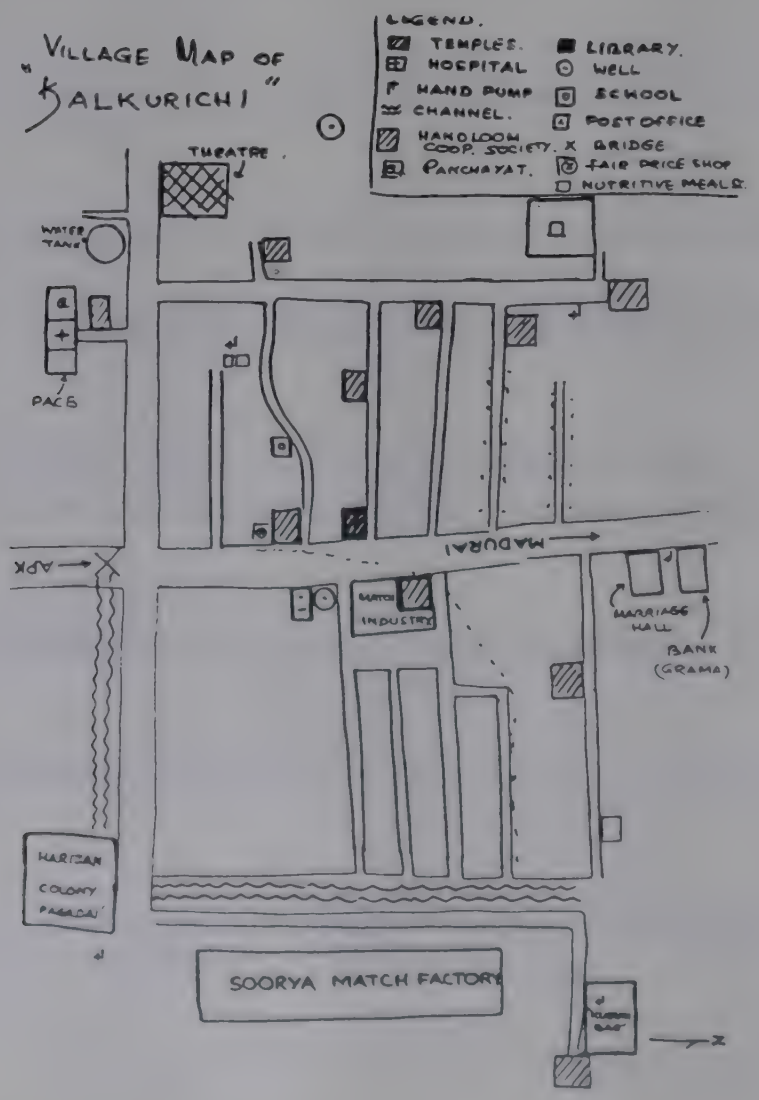
The PRA team discussed on the secondary data available about the Kalkurichi village and developed fairly good idea of the village before visiting the field.

2. Participatory Mapping

Just as the PRA team got down into Kalkurichi village, they could easily feel the curiosity in the faces of the villagers. Slowly villagers keep adding to the group around. Taking advantage of the situation, one of the PRA team members requested the villagers to show them their village through mapping. *"We are new to your place. Please show us how your village looks like"*. One person went in search of the sharp instrument by which he could start drawing the village map.

The village mapping started slowly and the villagers outlined the roads, the village approaches and then marked the two temples and the school. Then, canals and bridges were shown. Discussions became more and more animated as increasing numbers of people joined in. Other group members insisted on drawing the hospital, co-operative society, marriage hall, post office, bank, etc, thereby listing all the infrastructures existing in the village. Simultaneously one woman started lining the main road with white rangoli powder, mud roads with violet and schools with orange colour. They put a red cross to indicate the hospital. They marked the areas where ethnic groups were living with different colours. Because of the large number of households, they decided to mark houses by dots. One old man eventually said that there are also harijans living in the outskirts of the village and asked the approaches for that to be added. The colony was on the periphery of the village. As two of the team members continued to talk about the map with a group of villagers, other team members started seasonality diagrams with separate groups of men and women.

FIGURE 18



3. Wealth Ranking

The wealth ranking was conducted during a transect walk visit to Bharathi Nagar, a harijan colony at Kalkurichi village. The PRA team requested some villagers who were working in the field irrigating their chilli crop to make a diagram of their village. The process began with some young men, who took the sticks and started drawing on the ground. Soon after, some women from the nearby houses arrived. We gave them some rangoli powders and asked them to mark with different colours the fields, roads, trees, canals, dry and active wells, kilns etc. They chose the colours of their own. The group grew as curious villagers arrived with spades in their hands, curious to know what was happening. Young boys added tree leaves of the appropriate species.

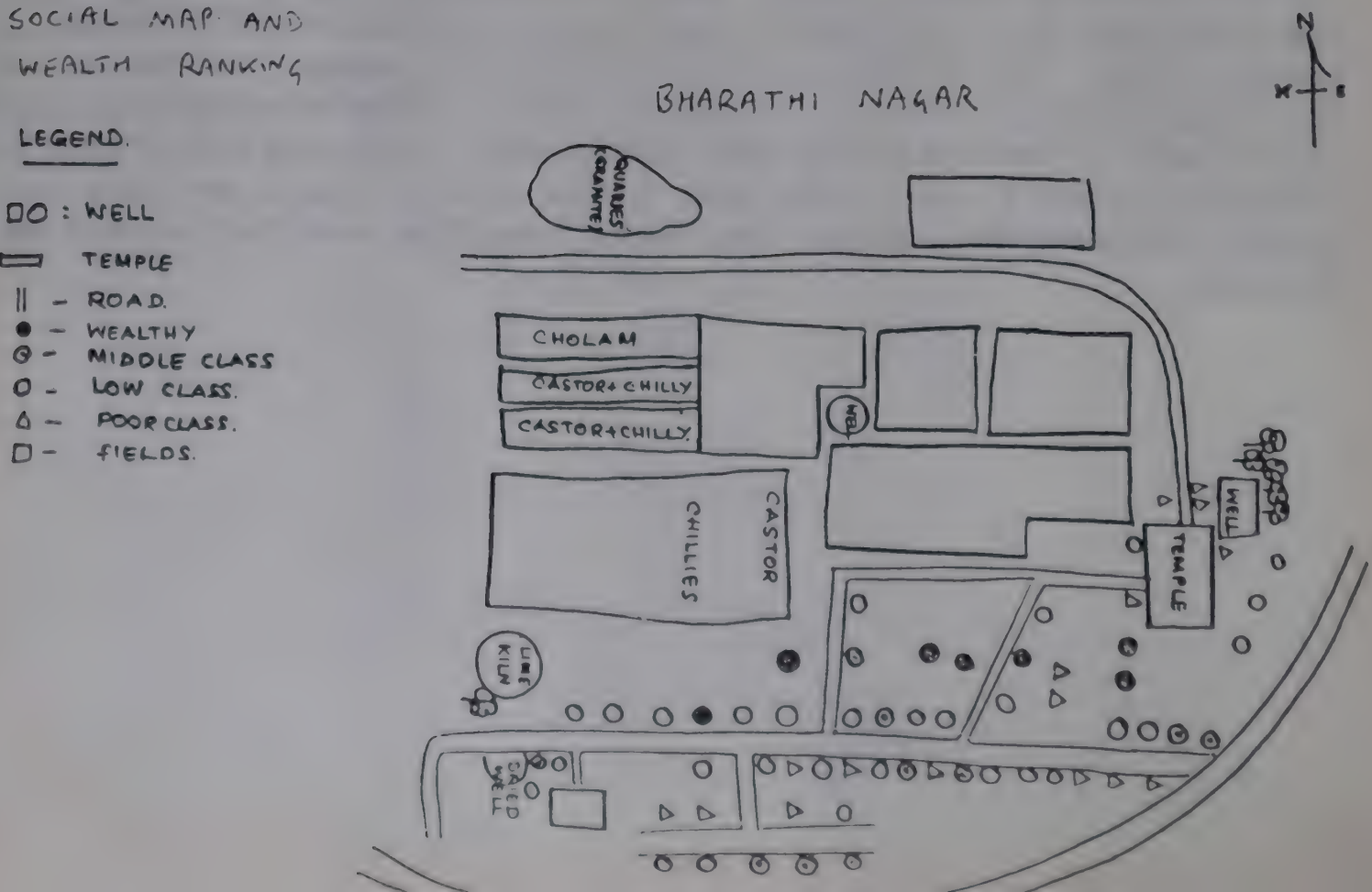
After some discussion about the resources of the village, the farming practices, we then asked them to indicate where all the houses were. They were asked to categorise the entire houses into wealthy, normal and poor based on some common criteria of well-being and wealth. They discussed among themselves for a while and marked the stones with colours of their choice. When enquired about the basis for their classification, they told that yellow was for wealthy houses: *"yellow is flourishing"*. These people had TV, radio, lands and in some houses their sons/daughters were working in government offices. The middle class houses were coloured with rose, who owned bullock carts and some land. All others were marked with green colour denoting as poor.

Then the PRA team started counting the number of houses in each category which came as yellow - 6, rose - 9 and green - 29. One of the team remembered that we had been told the previous day that there were some 65 households in Bharathi Nagar, yet only 44 had been classified. What happened to the rest? Soon came the reply that they are all huts. They are the downtrodden who depend on daily labour and so these huts were pointed out in the map with stones and orange colour put on them. One old woman came up and shouted, *"hey, why are you marking my house yellow?"* Other local people said *"aren't you wealthy? Aren't you having lands, house and animals?* They described the purpose of the PRA to her, and she was pacified. Once this picture of four classes had been produced, the PRA team was able to explore changes over time. The biggest problem had been an outbreak of foot and mouth disease 10 years ago that had killed many bullocks. There used to be 17 pairs, but now there are only 5. As a result, many families could not plough, but had to hand-cultivate. Many had thus fallen into lower wealth classes, from where there was little hope of escaping.

FIGURE 19

Class	Number of Families	Assets and Activities
Wealthy (yellow)	6	Working at match factory Income more than Rs 2500/yr TV, Radio Family member working in government Bullock carts Some cattle More than 3 acres land
Middle (pink)	9	Only agriculture Rs 1500/yr 1-2 acres land Bullock carts Some cattle
Poor (green)	29	Only agriculture Less than 1 acre No livestock
Very poor (orange)	21	Huts only No land No livestock Labour in quarry

SOCIAL MAP AND WEALTH RANKING

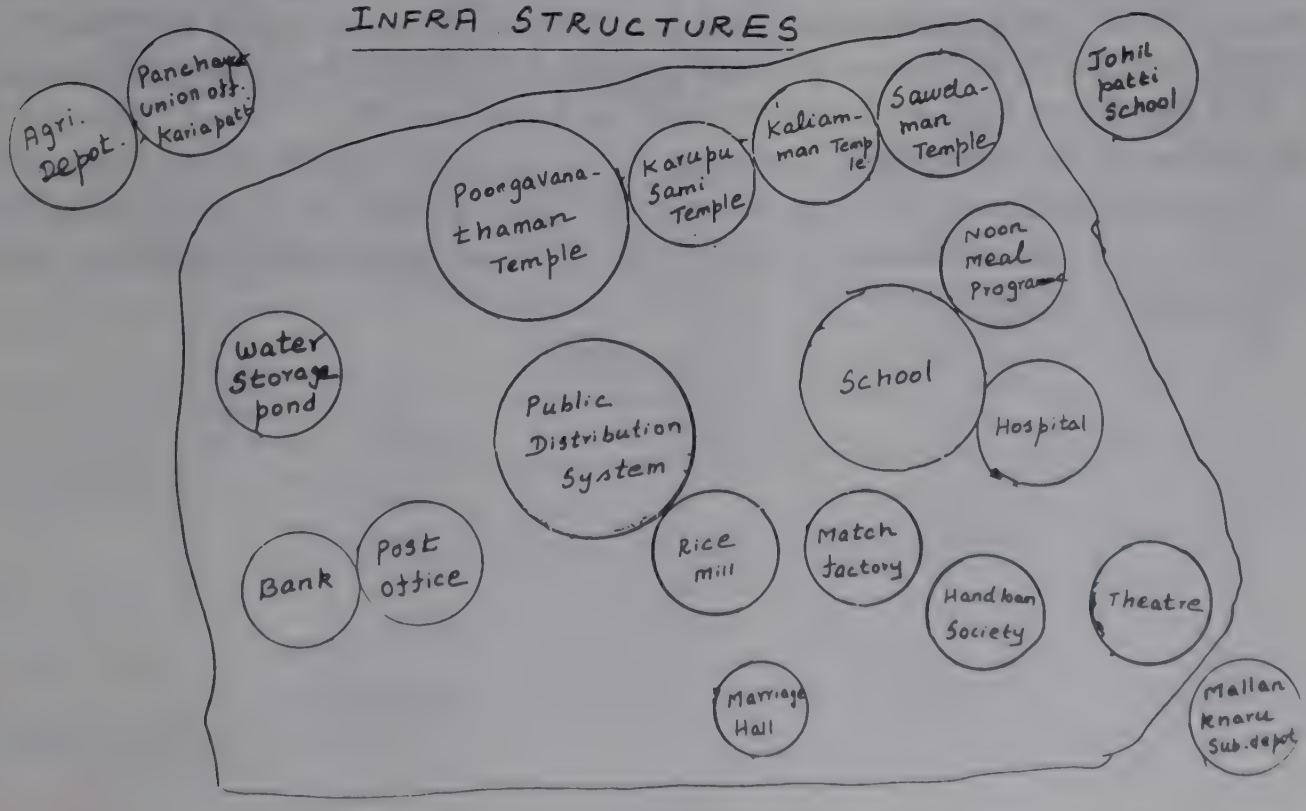


4. Venn Diagram

During the mapping exercise in Bharathi Nagar, two PRA team members took a small group of women aside behind the lime kiln, and asked them to draw the village mapping focusing on the infrastructural facilities available in their Kalkurichi. When the process started one girl told "ration shop", when questioned the girl said that there only we used to go to get rice for our food. Then another lady told Poongavanathamman temple where we used to go for worship on Tuesdays and Fridays. After they had produced a complete list of infrastructure the team explained to them how to draw Venn diagram.

They started doing this and placed the circles of paper on a large sheet of white paper provided by the team. One girl by name Selvi helped in writing the name of the institutions on the circle. All other women, men, boys and girls were standing around the diagram and giving suggestions on where to fix the temple circle and hospital circle and also on in the proper place. After the work is over girls going for school to nearby village for higher education listed their school and the team asked them to cut a circle and paste it outside the village boundary. They did it. Since a lime kiln is adjacent to the field, one farmer from that field came to have a look on what others were doing. When the team put the question where will you go for getting inputs such as seed, fertilizers and so on, he said *"We go to Kariapatti Depot"*. He immediately guided that girl to cut a circle and paste near the boundary of their village to show the Depot.

FIGURE 20



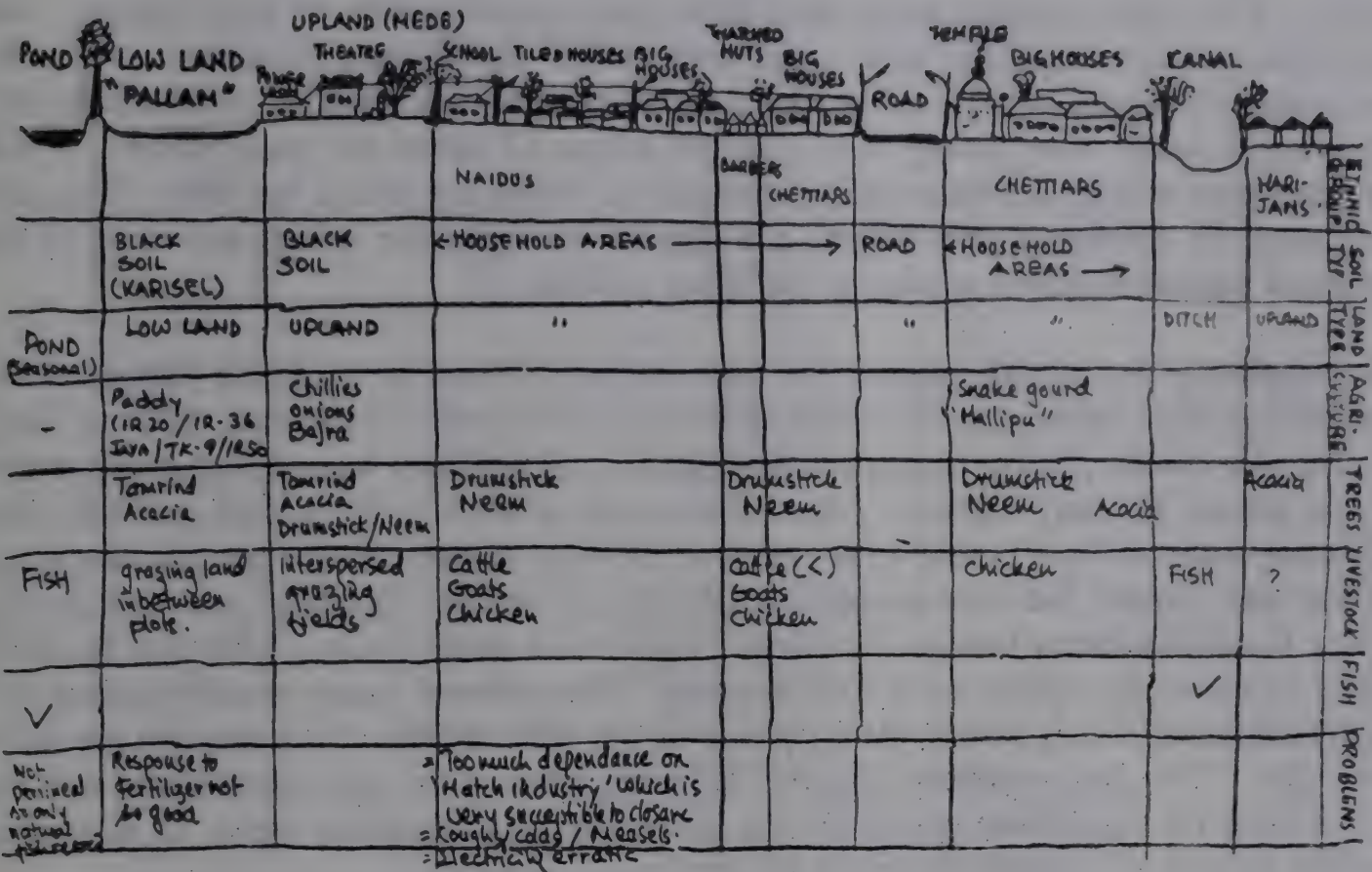
5. Transect Walks

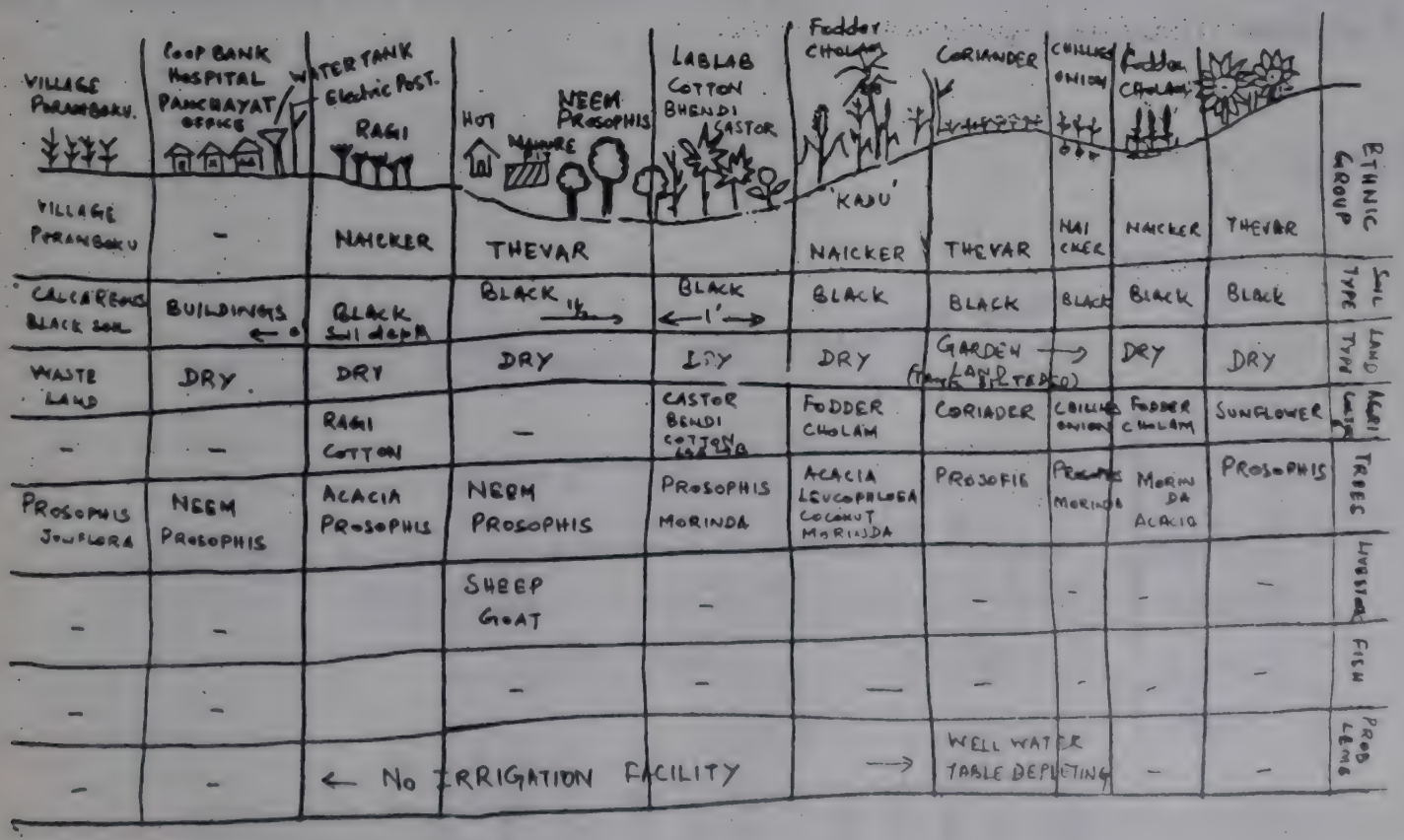
The PRA team began a transect walk on the first day from the western end of the village, where there was a pond, with the guidance of a group of local men. In the pond used to supplement irrigation, they were rearing fish. In the paddy fields, four varieties of paddy are being cultivated, namely IR20, IR36, Jaya, and TBM-9. One problem they mentioned was the increasing lack of response of rice to fertilisers. *"The performance of the old varieties was good even without any fertilisers"*, said one man. On the raised bunds were *Acacia nilotica*, *Prosophis juliflora, and Tamarindus*. Then the team moved further east looking at the powerlooms, cinema theatre, grazing land - upland with the naturally grown grasses surrounded by *Prosophis*, tamarind, *Acacia*, drumstick and neem. All these were meticulously noted down by the PRA team members. Enquiries were also made on the way about crops, soils, cattle, fuelwood use, livelihood opportunities etc. The team met many people of the village by walking through the built-up area.

On the second day, the team used the map to plan a walk taking in areas of the village not yet visited. This included a lengthy stay in a harijan community for social mapping, wealth ranking and seasonality analyses, various interviews with farmers in their fields, and interview with a contract livestock keeper, and a visit to one of the match factories. Employment opportunities have recently grown with the opening of two match factories, and most young people prefer the match factory jobs rather than work in agriculture (see no 13: Matrix Scoring).

The PRA team visited one of the match factories, which employs 200 children at present. Most are very young. Children first make up rows of 50 matches in heavy frames, which are then carried to men in another room, who process and pass to the wax dippers. From there the frames are carried to one of the few adults working in a non-supervisory role, who dips the frame and match ends in the phosphorus mix. The frames stand to dry before being carried to another room, where some 120 children sit in rows taking apart the frames and filling matchboxes. Other workers included box makers, packers, quality controllers. The frame fillers earn Rs0.5 per frame, and can complete 30-40 per day if they work hard (Rs 15-20). The box fillers earn Rs 0.5 per 2 trays, and can earn Rs 15 a day. The factory is prepared to take on as many people as it can. In the summer, during the agricultural low-season, the payroll swells to 300. Labour is drawn from villages up to 15km distant. The two factories, although separately owned, have a fixed wage agreement and separate catchment areas for labour.

FIGURES 21 & 22





6. Seasonality: Rainfall, Cropping and Price Patterns

While men and women were drawing their village map, some women around were talking among themselves. The team decided to engage these four women for making a seasonality diagram. The team members asked them about the rainfall pattern of their village. One among them answered that they used to get more rainfall during *Ipasi* (October). We asked them to help the explanation by using something to quantify the rainfall. Immediately they brought some stones. One among them said *"let us put 10 stones for Ipasi month"*. It was quite interesting to note that those ladies arranged the stones one above the other. They kept eight stones for *Karthegai* (November) and started arranging the stones according to the quantum of rainfall received in each of the other months.

After completing the rainfall pattern, the team enquired about the cropping pattern. They started telling about the sowing of each crop from the first month of the year, *Chitrai*. They said *"We sow cumbu (Bajra) during chitrai (April)"*. When they were asked to write this near that month, the lady replied: *"I don't know how to write"*. They then said that they would bring some seeds of cumbu to put them on the right month. As the process was going on in the open ground, the cumbu seeds started flying in the air. One boy, who was closely watching this immediately brought sand and spread into a small circle. After that he asked that lady to spread the cumbu seeds over the sand. They showed paddy nursery raising and groundnut dibbling during *vaikasi* (May) and so on for other months. They brought the seeds of these too. Thus they completed seasonal cropping patterns for both dryland and wetland with the help of suggestions given by the other villagers watching them. It was quite interesting to hear the suggestions given by each and every one.

Once this was completed, the team explored the fluctuations in prices throughout the year. All crop prices vary considerably, the lowest prices being down to half of the highest. The least fluctuation occurs in black gram.

FIGURE 23

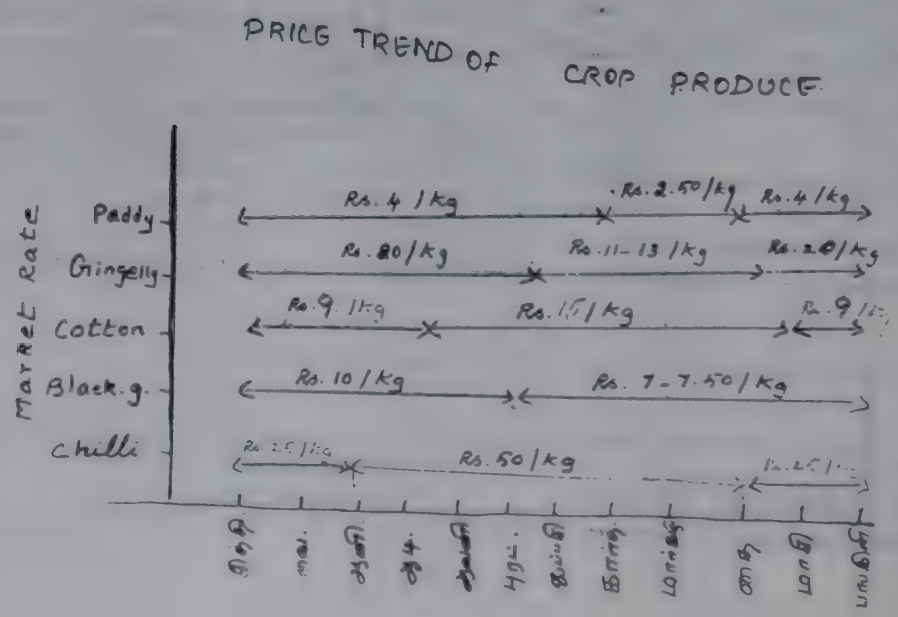
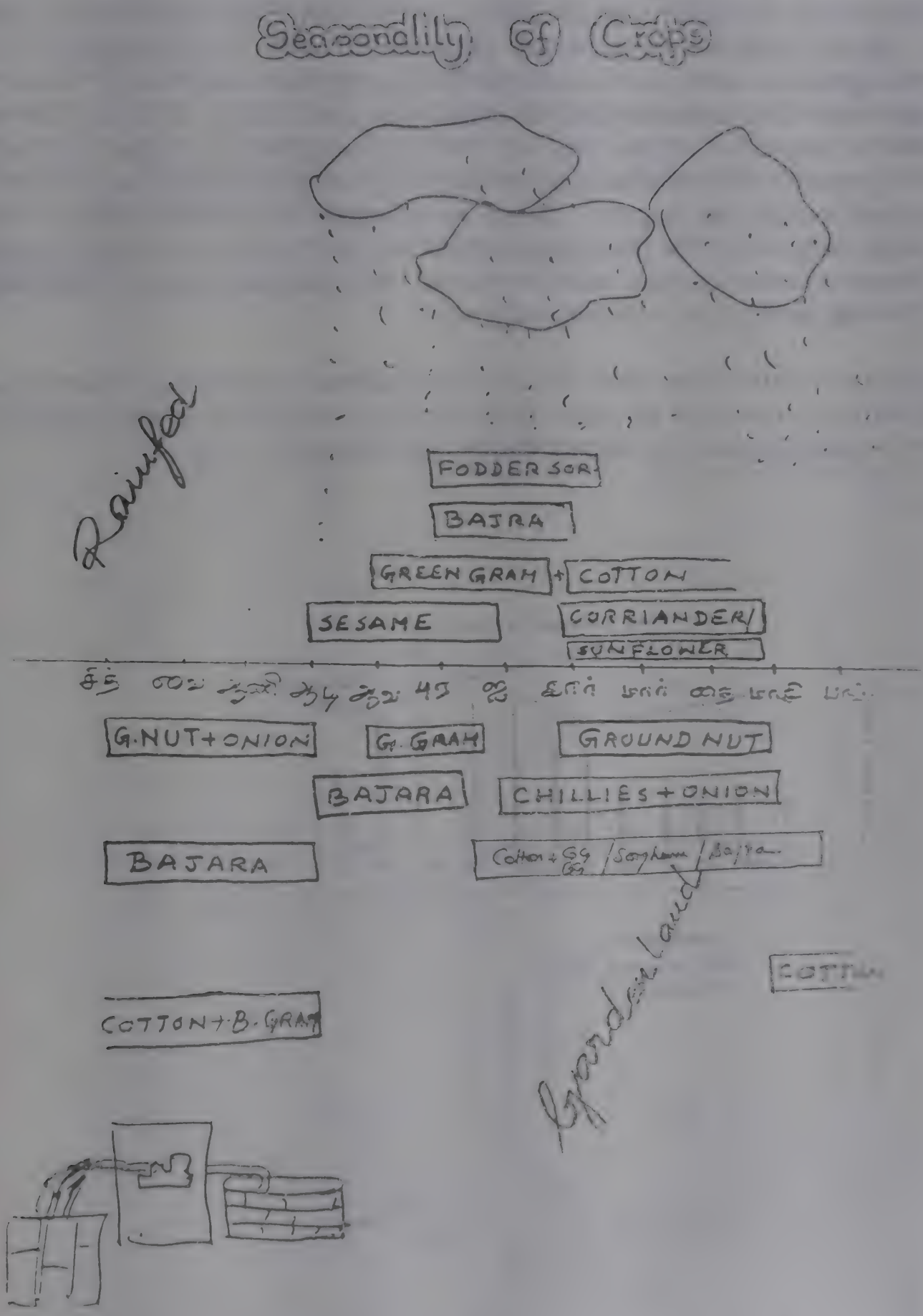


FIGURE 24

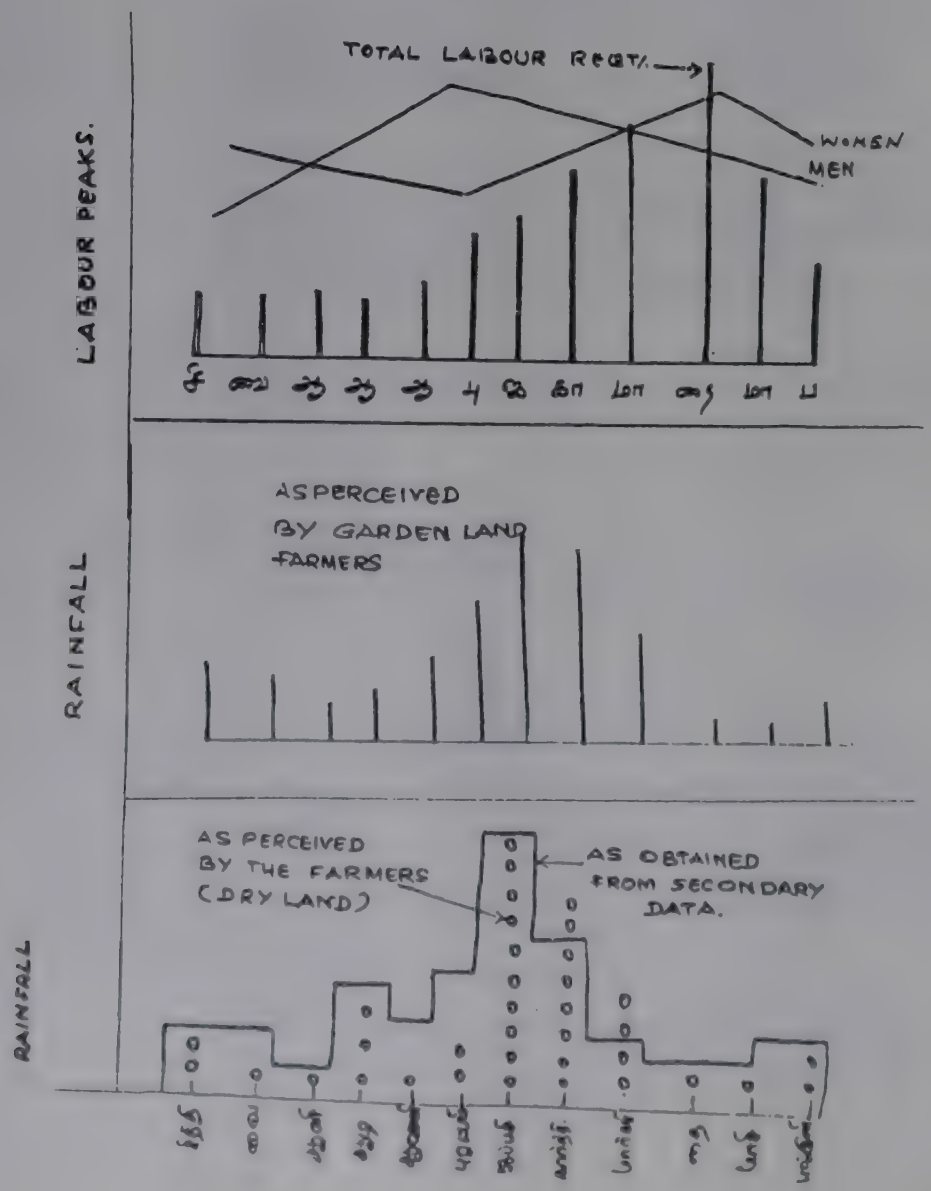

Seasonality of Crops
Rainfed
FODDER SOR
BAJRA
GREEN GRAM + COTTON
SESAME
CORRIANDER/
SUNFLOWER
G.NUT+ONION
G. GRAM
GROUND NUT
BAJARA
CHILLIES+ONION
BAJARA
Cotton + GG / Sorghum / Bajra
Irrigated Land
COTTON+B.GRAM

7. Seasonal Calendars: Rainfall and Labour

On an encounter a farmer returning from his fields on a transect walk, we started talking about the destination of the road, where they had been, etc. Then we enquired about the rainfall pattern during this year. After some discussion, he started telling about the amounts of rainfall. At this stage we sat down and asked him to show us the particulars on a diagram. He agreed and with much interest started drawing with a small stick. Since the markings were not visible in the dry soil, he started using small twigs. Even then he was not satisfied with the picture. At this stage the PRA team suggested him to use some green twigs for this purpose. He immediately pulled the fodder sorghum plants from the nearby field and started forming bar diagram. Before he completed the diagram, three or four villagers joined the process. The final picture tallied very well with the secondary rainfall data, and the patterns derived from other interviews. It is clear that farmers' knowledge gives a sufficiently good picture of rainfall patterns.

The group then gave information about the agricultural labour requirement of women and men during different months of the year. Men's was at a peak during *avani* (Aug-Sept), while women's labour demand was highest during *thai* (January).

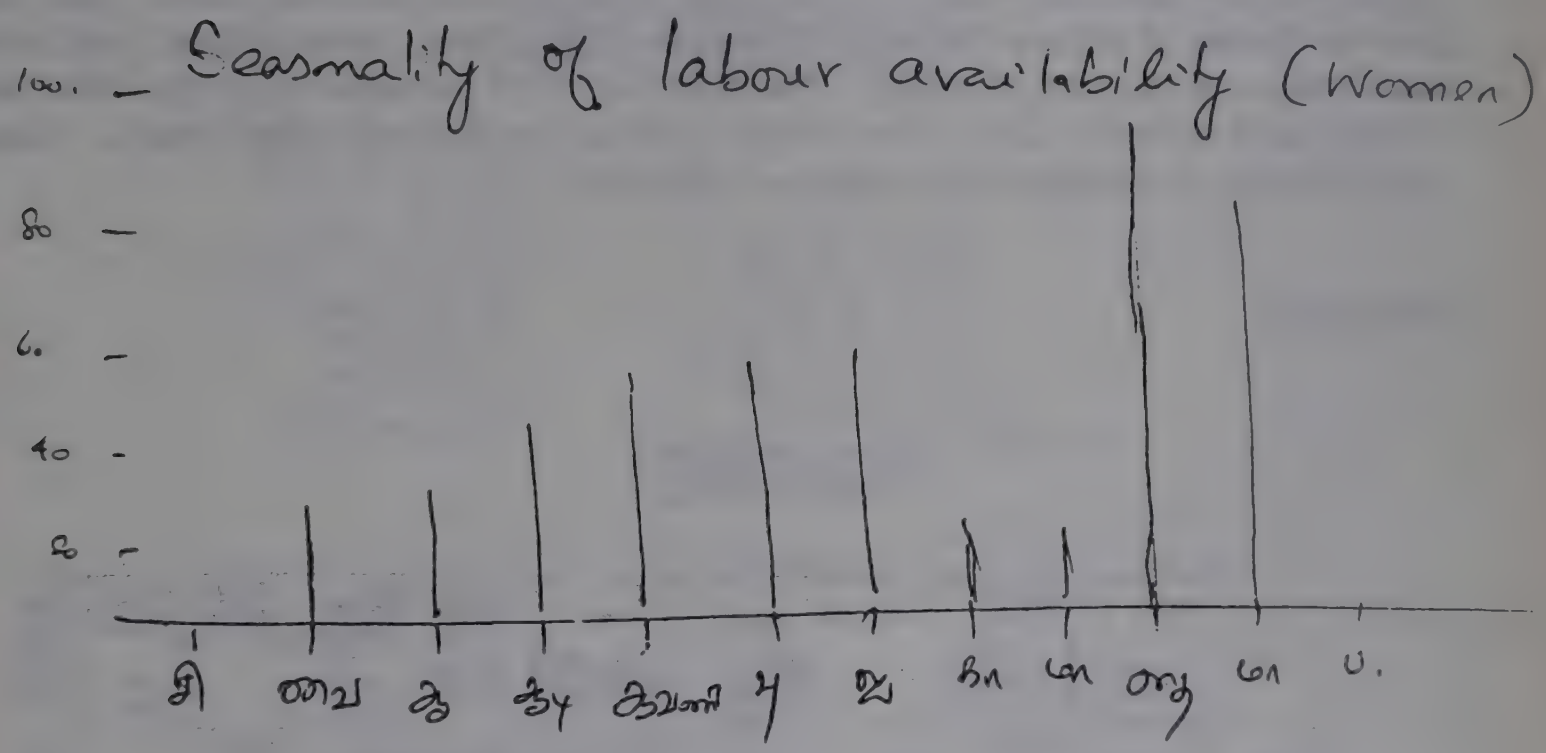
FIGURE 25



8. Seasonal Calendar: Women's Labour

After completing the venn diagram in the harijan community, the team asked the women present about their income and labour availability in agriculture. They immediately said they were fully engaged during *thai* (Jan) and *masi* (Feb). We asked them to explain their perceptions pictorially. They drew a straight line and demarcated the 12 months. Then they marked rainfall and labour patterns. When they had finished the work, another woman came by and asked what was going on. The others started explaining about what they had done. The team then used the picture to enquire about what they do in the two months went they get no work. They replied they will take out loans from the grocery shop, and hope to repay them over the following months.

FIGURE 26



9. Historical Changes and Time Line

On enquiry with an ex-military man the PRA team got an historical picture of the village. During the period before independence, rice was not cultivated because of the fear that the paddy would be taken by the colonial authorities. So the villagers used to cultivate millet such as varagu and sorghum, to be eaten as a gruel. After 1950's the villagers started cultivating paddy. The main varieties at that time were *Chandikar, Thoppi Chamba and Milagu chamba*. These produced about 24 bags/acre.

In the 1960's, cotton and cumbu were introduced. A pest resistant cotton variety, Karunganni, yielded 2.5 Quintals/acre was cultivated. During 1970's this was replaced by Lakshmi which yielded 0.5 Q more. In 80's they included chilli also. Low yielding paddy variety were replaced by IR varieties, said to give a yield of 30-40 bags/ acre. In the 1990s, LRA 5166 cotton variety derived from Lakshmi was introduced, yielding about 3.5Q/acre. It is the most widely cultivated variety.

During enquiry some more elder villagers also gathered and gave their views. They also gave the picture of historical changes in fuel, housing pattern, infrastructure, food habits, mass media and transport facilities. The main sources of firewood up to the 1960s were *Acacia*, agave and cow dung. In the 1970s, kerosene stoves became more common, though now *Prosophis* has regained importance as a fuelwood.

FIGURE 27

Time Line

Period	Name of village	Crops	Varieties	Yield	Fuel	House	Infra Structure	Food habit	Mass media	Transport
Before 1950	Sailanagam	Varagu cholam	Local		Acacia Agave		–	Cumbu Ragi Varagu	–	
1950's	Kalkurichi	Paddy Varagu cholam	Chandikar Thoppa chamba Milagu chamba	24 bags/ac	Acacia Agave cowdung Cake		village panchayat	do.	–	
1960's	"	Paddy, Varagu cholam, Cotton Cumbu	" + Karunganni	24 bag/ac 2.5Q/ac	-do.-		"	do + Rice		
1970's	"	-do-	do + Laxmi	3Q/ac.	Elanthamul		Post	Rice	"	"
1980's	"	do chillies	IR8, IR20 IR 36 Laxmi LRA5166	30-40 bags/ac 3Q/ac.	Prosophis		School Bank	Rice		
990's	"	-do-	-do-	30-40 bag/a 3-5Q/ac.	LPG		Temple Match factory Nursery	Rice	-do-	

10. Crop Biographies: Cotton and Rice

The team met a man and woman working in their fields. After discussing about rainfed crops, we asked what cotton varieties have been sown in the field. They said it was LRA 5166. Having established details of this crop, we then proceeded to ask about varieties grown previously. This led to a discussion of the relative merits and the reasons for switching from one variety to another. In this way, details of duration and yields were obtained. The older varieties of cotton are attacked by fever pests, are longer duration and have a lower lint:seed ration. They apply neem oil with hand operated sprayer to control the pests on new cotton varieties. But there are still major problems with stem weevil attack. The same process was used to gather details of paddy cultivation. No rice was grown before the 1950s. Three tall varieties were grown to the 1980s, and these were followed by the introduction of three short duration, short stand varieties, IR8, IR20 and IR36.

FIGURE 28

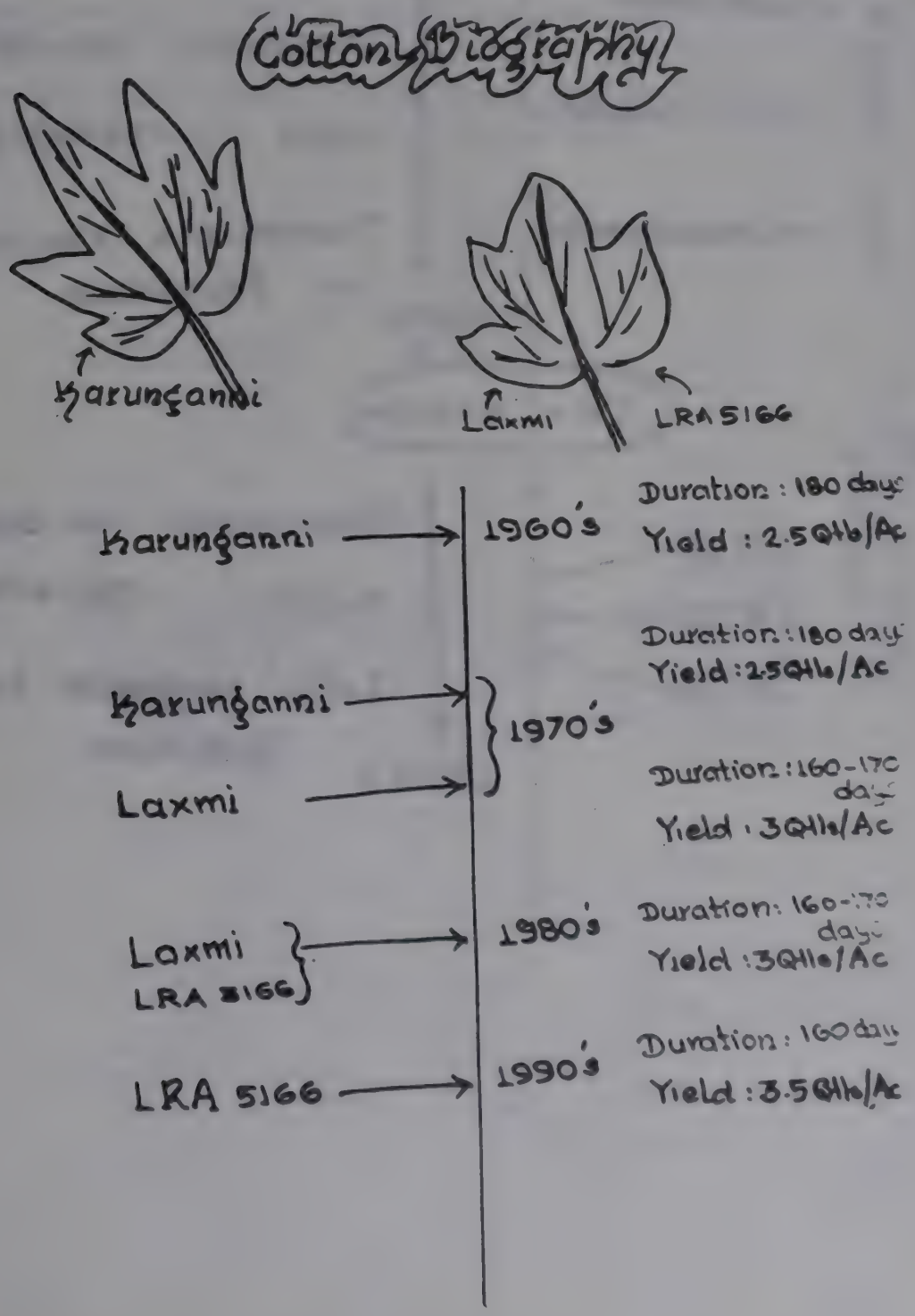
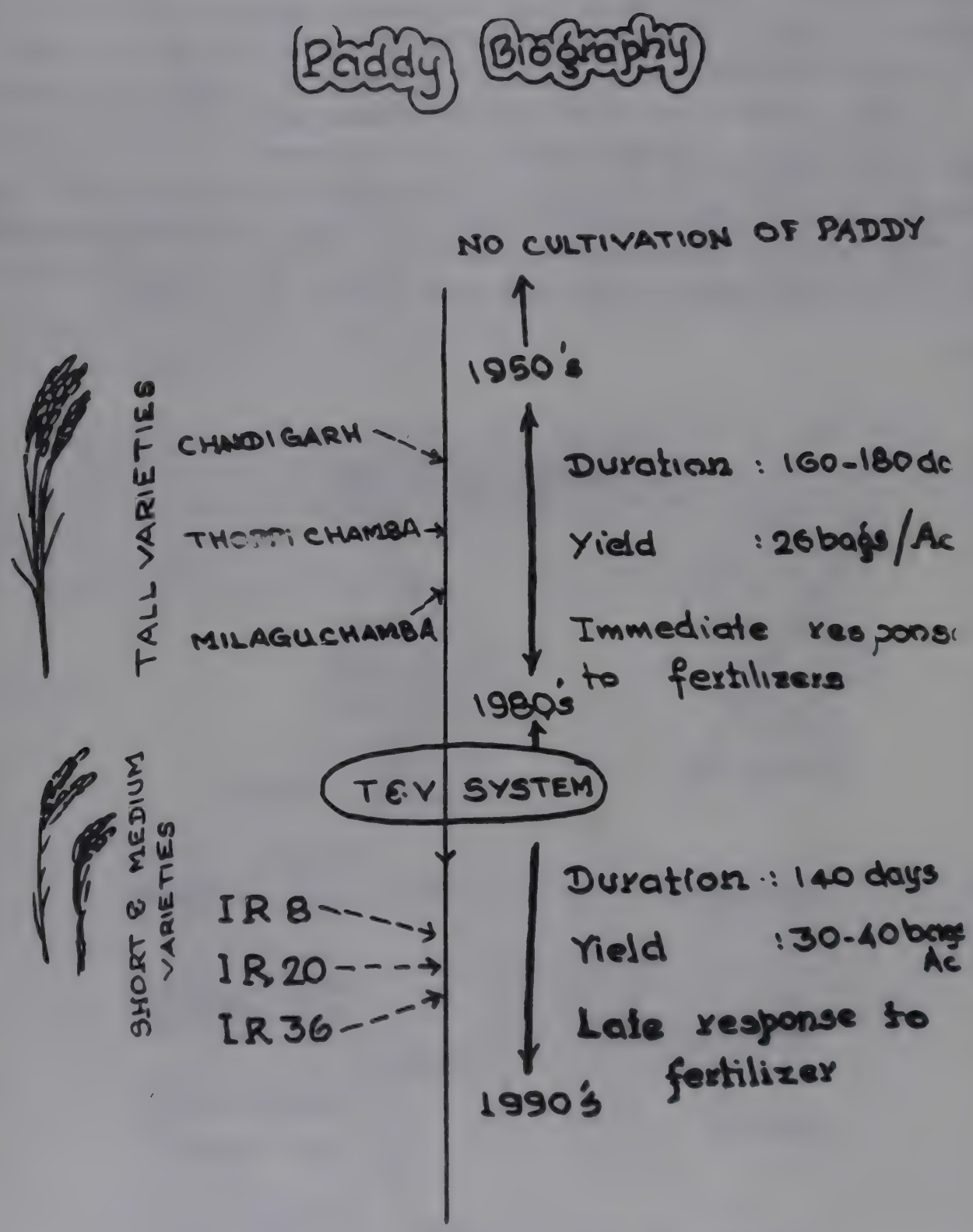


FIGURE 29


Paddy Biography
NO CULTIVATION OF PADDY
1950's
TALL VARIETIES
CHANDIGARH
THOTTI CHAMBA
MILAGUCHAMBA
Duration : 160-180 dc
Yield : 26 bags/Ac
Immediate response to fertilizers
1980's
T & V SYSTEM
SHORT & MEDIUM VARIETIES
IR 8
IR 20
IR 36
Duration : 140 days
Yield : 30-40 bags/Ac
Late response to fertilizer
1990's

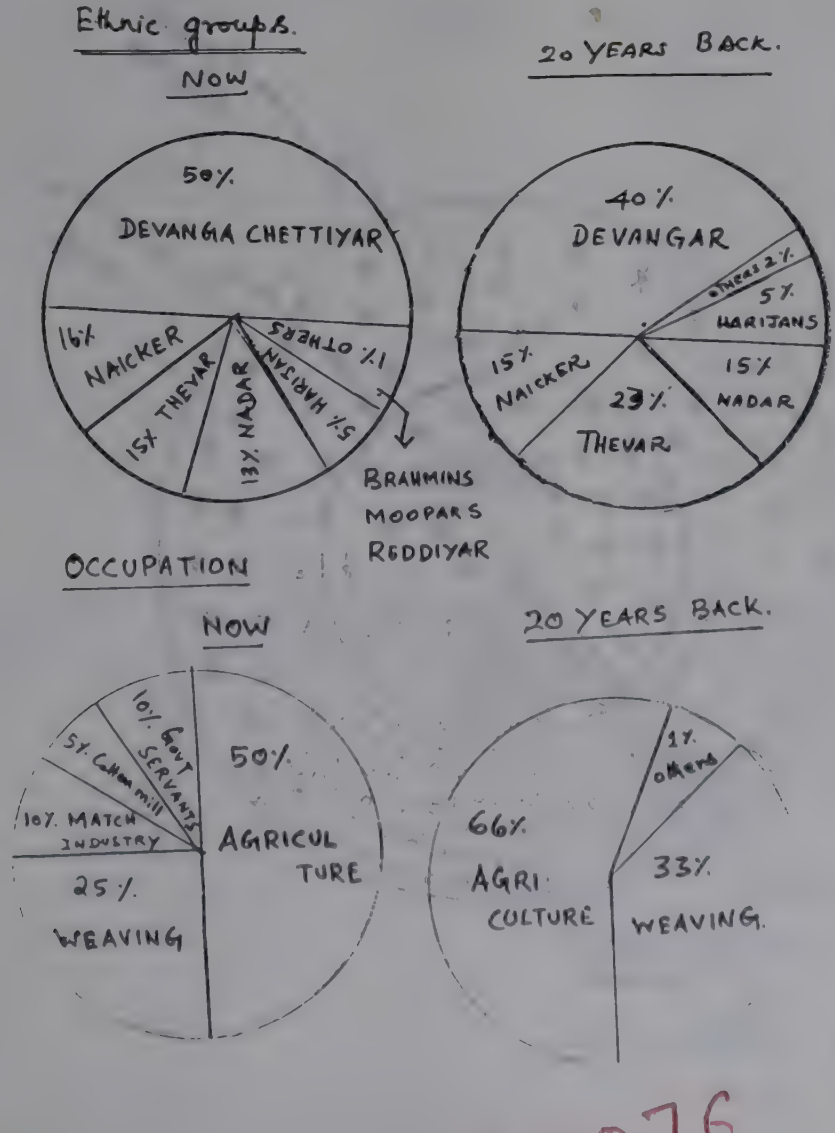
11. Pie Diagrams: Ethnic Groups, Occupational Change and Irrigation Details

The team used pie diagrams in three different interviews to explore aspects of ethnic groups, occupational and income change, and irrigation details. The ethnic group details were collected from a 65 years old male family head. According to him currently about 50% of the population belongs to Devanga chettiar community. Except in Devanga and Thevar communities there was not much variation in the percentage of different communities some 20 years back.

The team also had a discussion with an old lady about the proportion of people involved in different livelihood activities. The diagramming was done by spreading a large circular mat with seeds. The circle was divided into sectors during the discussion, and changes needed to be made, the lines could easily be rubbed out and a new diagram produced. Both agriculture and weaving have declined in importance, as the match and factories and cotton mills now draw away labour.

Following an interview with 3 male farmers, it was clear that 25% of the land was irrigated by wells. But more than 75% of wells existing in the village have sour water unsuitable for irrigation. In the last 20 years goats, draught animals and poultry have declined in numbers. But there has been an increase in sheep and milch animals.

FIGURES 30, 31



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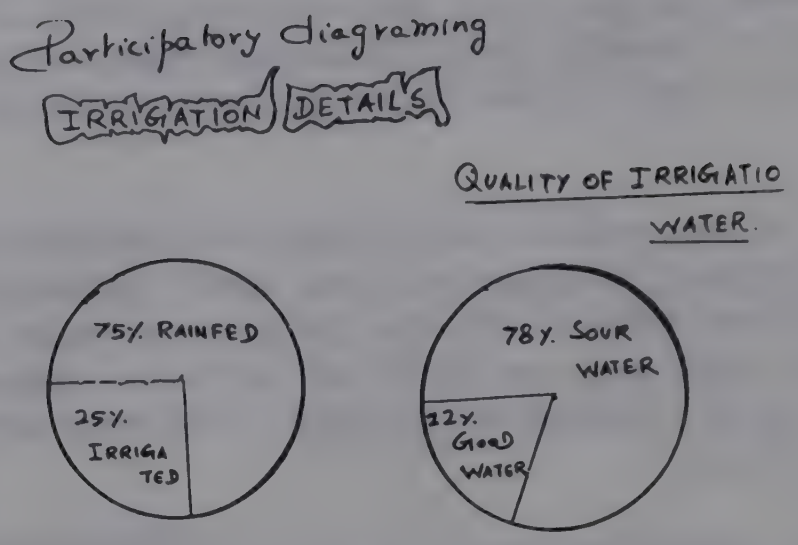
LIBRARY
AND
DOCUMENTATION
UNIT
BANGALORE.
03076
AGR 100

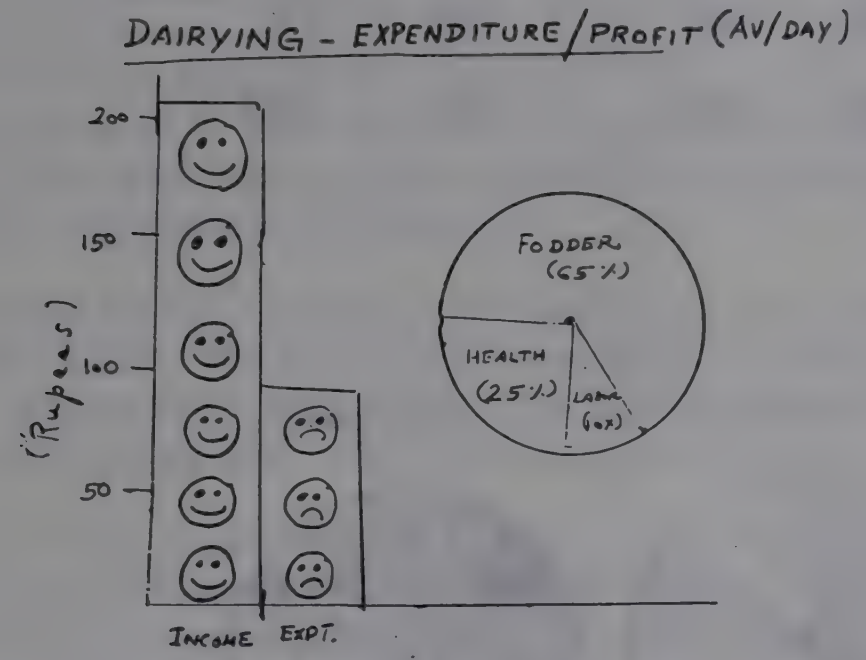
FIGURES 32, 33

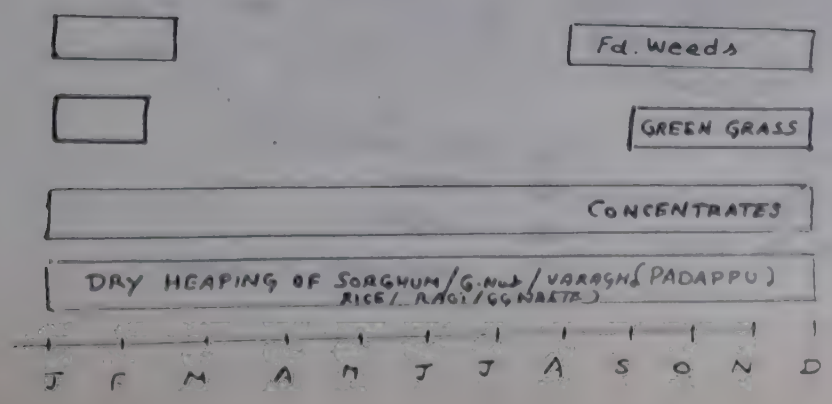


12. Economics of Dairying and Seasonality of Fodder

A woman farmer owning 5 milch cows gave details of her enterprise. She spends on an average day Rs. 65/- for fodder (grass, dry straw and concentrates), Rs. 25/- for medicines and health treatment and Rs. 10/- for labour. Each day she gets 35 litres of milk, which she sells for Rs. 6/litre. Her greatest constraint to expansion of the herd is in the marketing of milk. There are problems with lack of payment and/or delays of 3-6 months before payment by agencies. She uses a wide range of dry leaves and weeds obtained from the fields for fodder during Sept-February. Concentrates are used year round.

FIGURES 34, 35



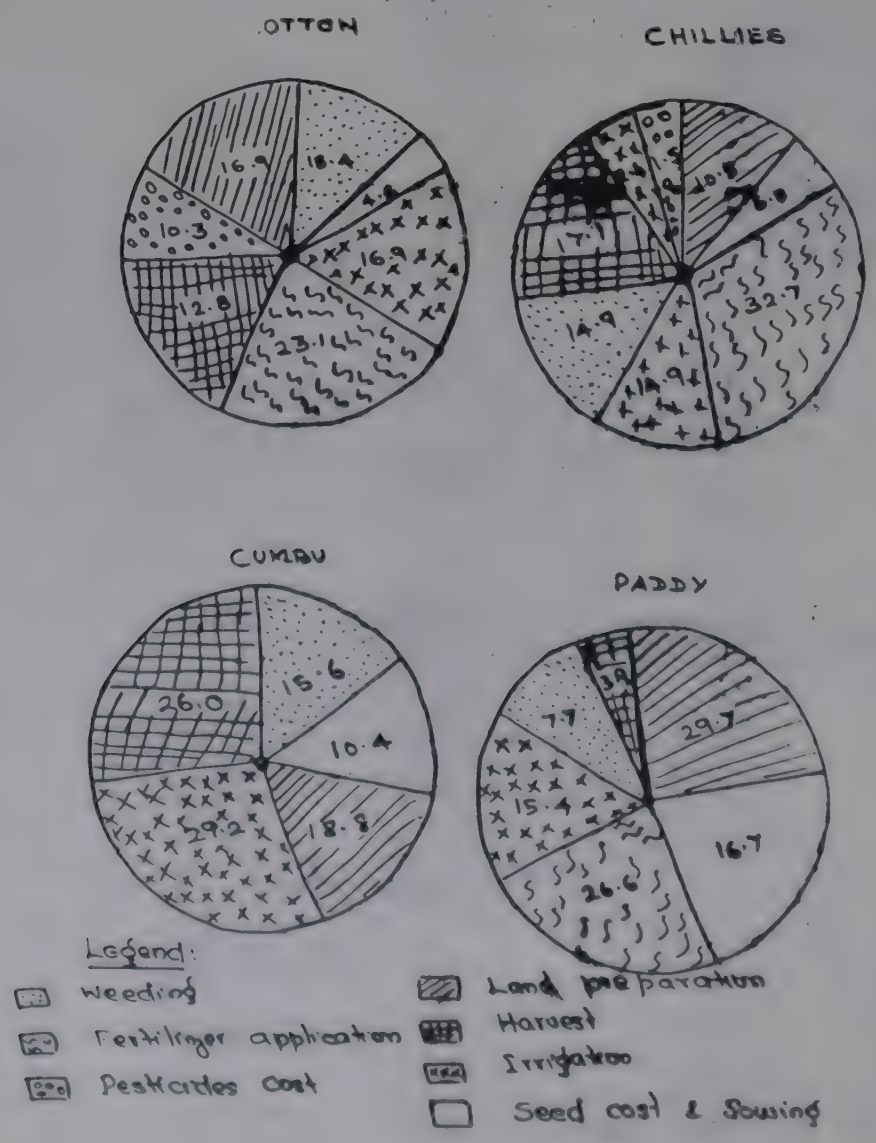

FODDER SOURCE CALENDAR
Fd. Weeds
GREEN GRASS
CONCENTRATES
DRY HEAPING OF SORGHUM / G.NUT / VARAGU (PADAPPU) RICE / RAGI / GG WASTE
J F M A M J J A S O N D

13. Cost of Cultivation of Major Crops

We enquired about the costs of cultivation with a group of farmers in their fields. Paddy is the most costly, and cumbu the least dependent on external resources.

Activities and Inputs	*Cotton*	*Chilli*	*Cumbu*	*Paddy*
		(Rs/ acre)		
Land Preparation	330	430	180	1160
Seed cost and sowing	90	250	100	650
Weeding	300	1325	150	300
Fertilisers	450	600	0	1035
Irrigation	330	600	280	600
Pesticides	200	100	0	0
Harvest	250	700	250	150
TOTAL	*1950*	*4005*	*960*	*3895*

FIGURE 36



14. Matrix Scoring on Livelihood Occupations

During one of the visits to the village, the PRA team requested one of the school going girls to help in under standing the livelihood occupation of the village through matrix ranking. A chalk piece was provided for her. She put a horizontal line and wrote the major occupations of their village on the cement floor in front of a house. By then few more girls and boys gathered around. The team asked her to write the features of occupation one after another and rank the different occupations according to the features by placing stones in the boxes. More stones would be for the more advantageous aspects and less for less advantageous feature and so on. As soon as she started doing the youth gathered started interacting with her and themselves got involved in the process and had lengthy deliberations. Thus they finalised the matrix scoring.

According to them, the income/day was more in agriculture followed by match factory, cotton mill and weaving depending on the turn out of work. Since income from the match factory and mill depends on their work turnout they have to work for more hours to get more revenue whereas in mills and agriculture, the working hours are fixed at 8 and 6 hours. Regarding the nature of work people have to struggle under the hot sun under agriculture, whereas in other work were of indoor nature. Further, the mill workers and weavers have to work with machines and with much care.

Agriculture and weaving all seasonal and employment will not be there throughout the year. In the match factory and in cotton mill people are employed throughout the year with holidays on Sunday and at festival times. The mill workers and match factory employees are also given bonus every year. This benefit were not enjoyed by weaving and in agriculture.

But people working in mills and match factories were affected by asthma, tuberculoses, and had hearing and sight problems, due to the chemicals used in the factories, particularly the phosphorous in the match factories. Whereas agricultural workers have better health since it was a form of exercise as per the statement of one of the farm labourer.

According to the overall rating of the matrix scoring done by the youths of the village, the match factory employment ranked 1st followed by cotton mill, agriculture and weaving. This shows that the weaving arid agricultural operation were declining in this area, whereas cotton mills were developing at a rapid rate.

We then asked the agricultural labourers and agriculturists, how we can shift agriculture from 3rd position to 1st. *"What is required to make agriculture more favourable"?* They interacted and told the following:

- fixed rate for inputs, such as fertilizer;
- supply of good quality seeds through agricultural depot;
- reduce variability of market prices for produce.

FIGURE 37

Livelihood

OCCUPATION / FEATURES		MILL	WEAVING	AGRICULTURE
INCOME / DAY	OOOO	OOO	OO	OOOO O
REST TIME/DAY	OOO	OOOO	OOOO O	OOOO O
EASINESS	OOOO O	OOOO	OOO	OO
MAN DAYS/YR	OOOO O	OOOO O	OOO	OOO
BONUS	OOOO	OOOO O	–	–
HEALTHINESS	OO	O	OOO	OOOO O
OVERALL RATING	23	22	16	20

Matrix Ranking by Women.

15. Livelihoods of Different Ethnic Groups

The team members met different members of the ethnic groups on different occasion during their field visit. These were five major ethnic groups in that village, namely *Chettiyar, Harijan, Nadar, Naidu* and *Theval*. During the early days they were doing agriculture and weaving for their livelihood. Later their activities diversified towards dairy, match works, trading, working in cotton mills, marson and other employment.

The *Chettiyar* community now depends upon weaving (75%) around 10% of them engaged in match works which is giving regular income. They have also diversified their activities in trading 4%, cotton mills 4% and other employment 5% such as teachers, clerical staff etc. Only 2% of them are engaged in agriculture. Most of the *Harijan* (84%) are engaged in agriculture. Around 10% of them were doing dairying. Masonry 5% was also another avenue for their livelihood. Only 1% of them were working in match factory. The *Nadar* community, who were doing agriculture in the early days, have switched over trading 25%, dairy (10%) mill (10%) match (5%), mason (2%), and other activities (15%). But only 33% of them were still continuing agriculture. *Naidu* are the only community with mostly (75%) dairy agriculture as their livelihood. The rest of them were engaged in match factory (5%), trades (5%), mill (5%), and other activities (10%). The *Thevar* community diversified their activities to masonry (60%) from agriculture. Only 10% still were continuing agriculture. Around 26% dairy dairying for their livelihood. The other field of activities were match factory (2%) trading (1%) and other activities (1%).

FIGURE 38

LIVELYHOOD OF ETHNIC GROUP

(PERCENT)

LIVELY HOOD \ ETHNIC GROUP	CHETTIAR	HARIJAN	NADAR	NAIDU	THEVAR
AGRICULTURE	2	84	33	75	10
WEAVING	75	–	–	–	–
DAIRY	–	10	10	–	26
MATCH	10	1	5	5	2
TRADING	4	–	25	5	1
MILLS	4	–	10	5	–
MASON	–	5	2	–	60
OTHERS	5	–	15	10	1

16. Livelihood Strategies in Kalkurichi

There are a range of options for people with and without land in Kalkurichi. But recent changes in opportunities are producing some very rapid changes. Agriculture appears to be in decline, as people are drawn to the small-scale industry. Weaving too is under threat. One weaver said *"in five years' time, we will be completely closed, even me"*. There has been a 60% decline in weaving since the match factories opened. Three people can earn Rs. 24/day in weaving, but Rs. 30/- in the match factory plus the 10% bonus twice a year. Weavers used to keep goats, and land but agriculture became so risky they stood to lose all from to time. They sold all and now concentrate on weaving. One woman said *"if a man has agriculture only, he can only sustain, but with match industry he can increase welfare"*.

FIGURE 39

17. Matrix Scoring: Paddy Varieties

The PRA team had a discussion with a farmer who was making a paddy storage bin with local materials. He explained about the storage bin, the skills required and the cost to make (Rs 200). This naturally led to a discussion about paddy cultivation and varieties. As he clearly knew a great deal , the team requested him to draw a matrix using chalk and stones. He put the varieties' names on the columns and seven criteria in the rows. Five other farmers also joined the process one by one. They selected Chandikar, IR 36, IR 20, J 13 and IR 50 as varieties; and yield, storing quality, resistance to pests, fineness of grain, least expenditure for fertilizers, least cost of cultivation and net returns as the criteria. They were asked to give rank by putting small stones in each box against each variety based upon the different criteria evaluated by them. IR20 scores best overall, particularly as it can be stored overnight in water without becoming solid, but it is liable to peat attack. Chandikar, the traditional variety, is pest tolerant, capable of growing without fertilisers, is not costly to cultivate, but only yields 40% of IR20. The farmer said *"the performance of the old varieties was good, even without any fertilizers"*.

FIGURE 40

PADDY VARIETIES

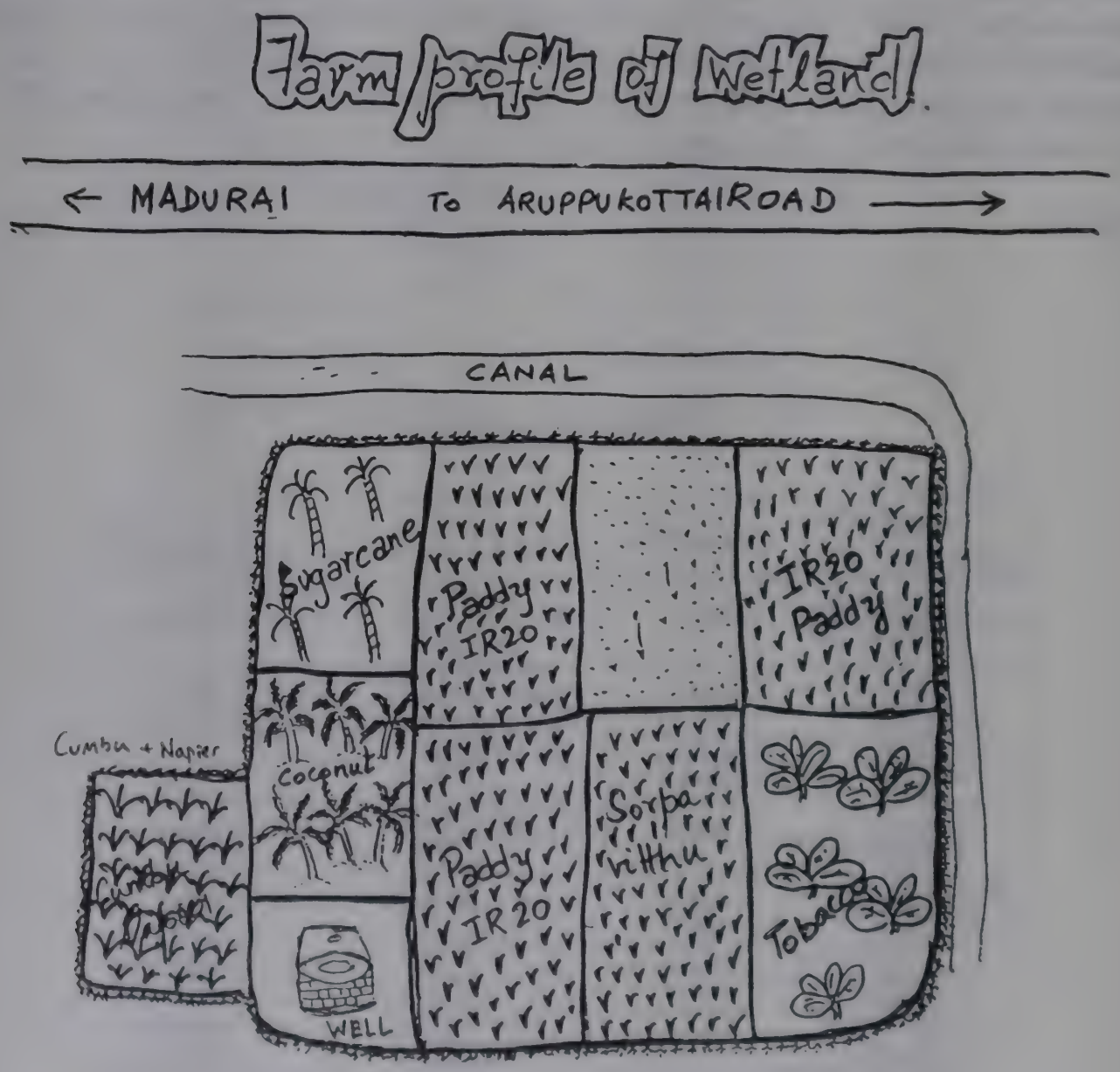
VARIETIES / CRITERIA	Chandikar	IR.36	IR.20	J.13	IR.50
YIELDS / ACRE	OO	OOO O	OOO OO	OOO	OOO
STORING QUALITY	OO	OOO O	OOO OO	OOO	OOO
TOLERANCE TO PESTS	OOO OO	O	O	O	O
FINENESS	OOO	OOO O	OOO OO	OOO	OOO
FERTILIZER	OOO OO	OOO	OOO	OOO	OOO
LEAST COST CULTIVATION	OOO OO	OO	OO	OO	OO
RETURN	OO	OOOO	OOO OO	OOO O	OOO O
Preference	V	II	I	III	III

Matrix Ranking by Me-

18. Farm Profile: Wetland Farm

The PRA team visited a wetland farm of Mr. Natarajan. A well on the farm supplies water. The farmer cultivates rice (IR20 and local *Sorpa Vithu*), sugar cane, tobacco, coconuts, cumbu and napier grass. The crop rotation he normally follows is rice (Nov-Feb) - Greengram/groundnut (Mar-May) - Pearl Millet (June-Sept). For rice the farmer has added farmyard manure and a complex of inorganic fertilisers. They use new seed only once every 3-4 years. The napier grass is grown for the 3 cows.

FIGURE 41



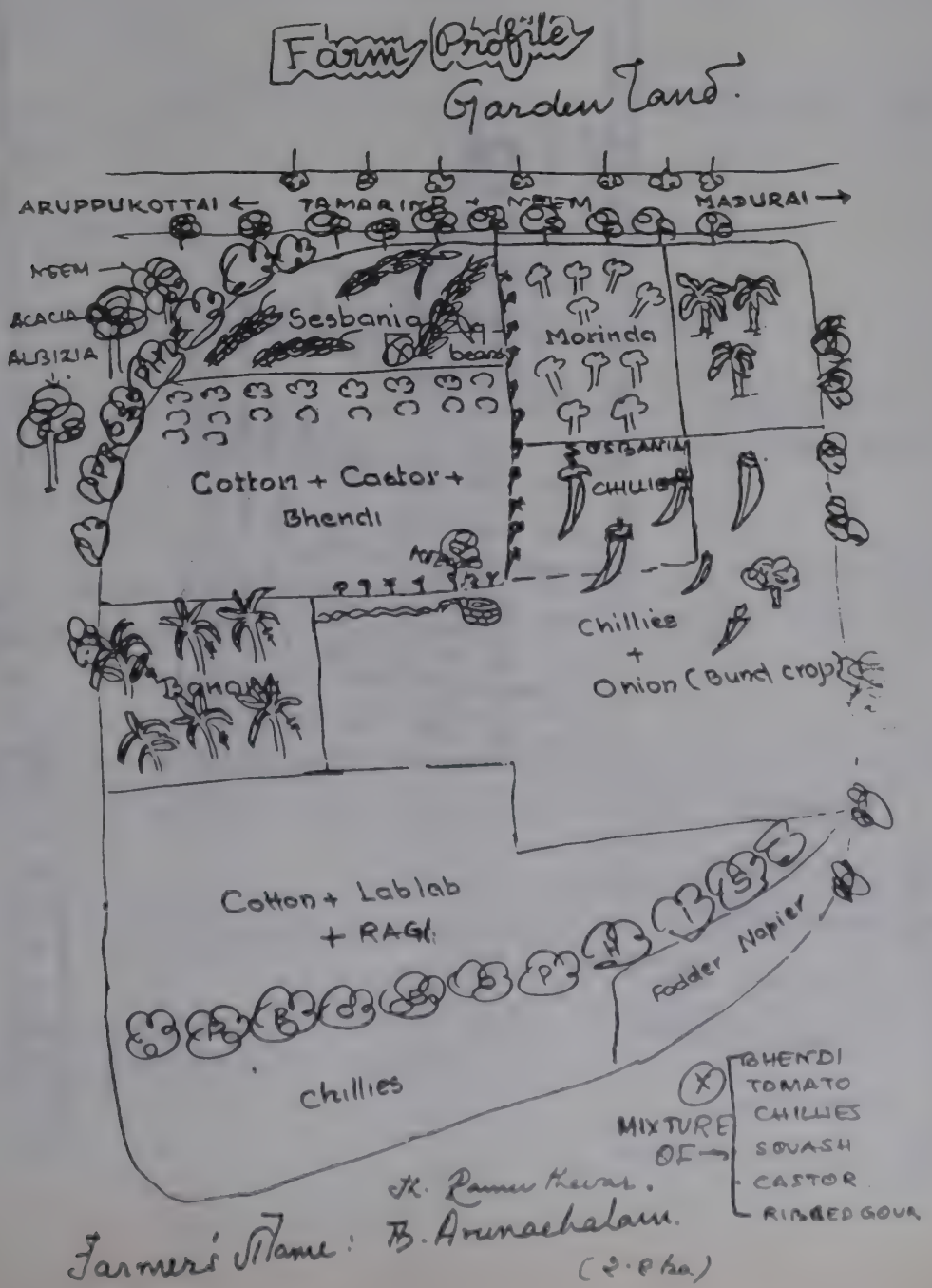
19. Farm Profile: Integrated Garden Farm

The PRA team visited a complex and integrated farm of 2.8 hectares, and talked with the farmer at length. There are neem and prosophis, which act as a biofence and other trees (Morinda, Albizia, Acacia, Sesbania, banana and coconut). The cropping is intensive, making use of many intercrops of vegetable and field crops. These intercrops include:

- cotton with castor and bhindi
- sesbania with chilies
- cotton with lablab and ragi (finger millet)
- chilli with onions
- squash (ground) with castor, beans and chilies

The farmer raises sesbania crop in order to get a daily income by selling in bundles for feeding to milch cows and goats. He used only organic materials, plus tank silt. He said that *"inorganic fertiliser spoils the soil's performance"*. He does spray for pests and disease control. He is of the opinion that summer ploughing reduces the incidence of weeds on the farm.

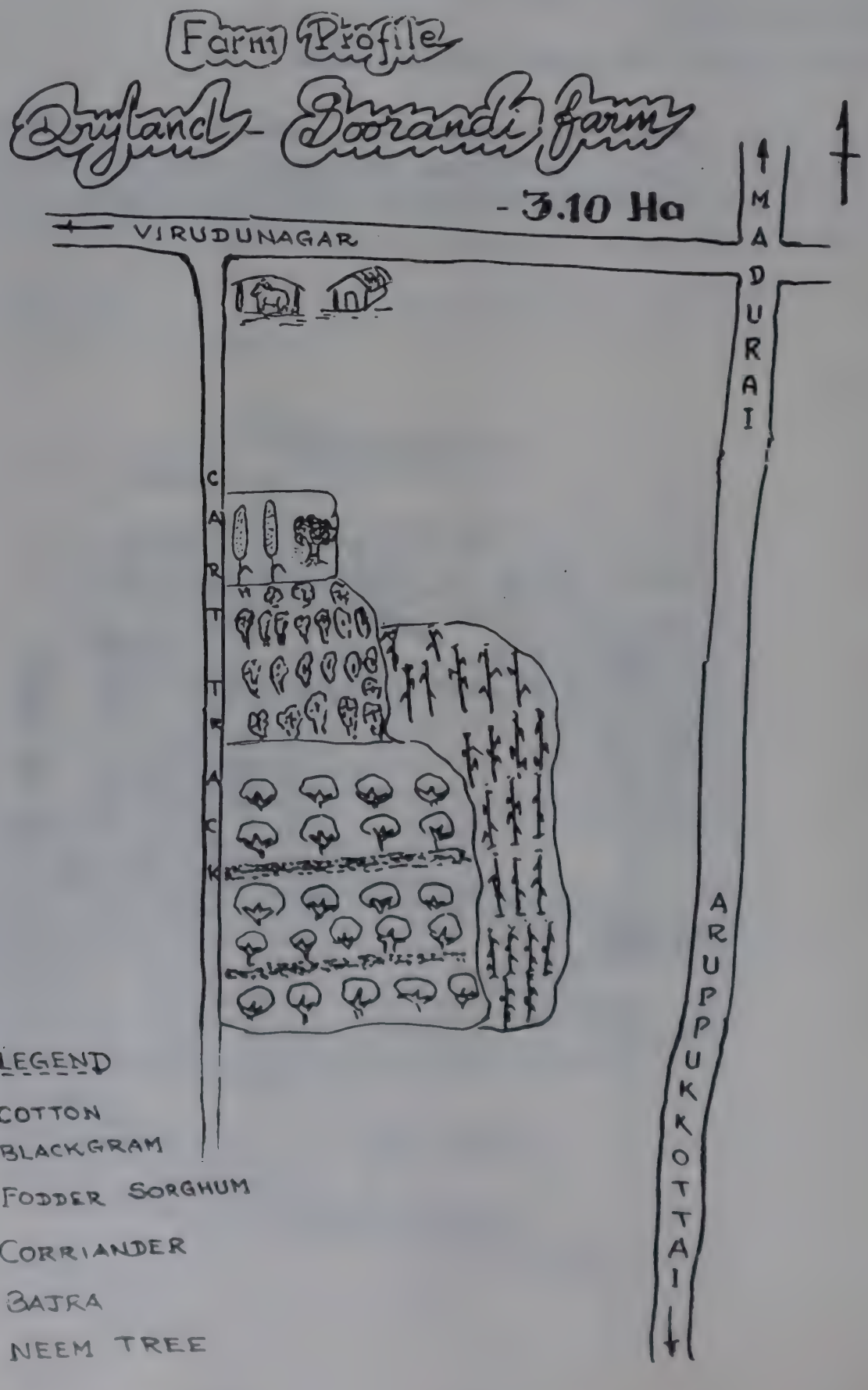
FIGURE 42



20. Farm Profile: Dryland Farm

The team visited an entirely dryland farm, on which were grown a combination of cotton, blackgram, fodder sorghum, coriander, bajra and neem. He grew the mixture because of the decrease in soil depth and variation in soil fertility. The PRA team was able to observe gullies on the southeastern part of the farm, where erosion was severe. He was growing blackgram amongst the cotton to improve soil fertility. To check soil erosion he is using stones and vegetation at the edge of each field.

FIGURE 43



21. Inventory of Local Innovations and Practices

- To make sowing more easy, cotton seeds along with lint are rubbed by mixing with sand or cowdung to remove fuzziness;

- For goats and sheep suffering from measles, the villagers used to cook rice with excess water, decant the supernatant liquid and allow to ferment. Cows milk is added to this fermented solution and fed to the animals for 3-4 days.

- To control diarrhoea in goats, Jhuthi (*Abutilon indiana*) leaves are fed.

- To control fits in goats an iron rod is heated and marked on the forehead.

- Before the introduction of inorganic fertilizers and even now, the goats are allowed to pen in the field. During penning the goats are moved from one place to other so that the manure gets distributed evenly all over the field. If penning is not done, soil is mixed with the dried urine and dung of sheep, and applied as an organic fertiliser.

- The farmers invariably grow castor as an intercrop in the fields, so that while taking goats to grazing areas they can pluck the castor leaves for feeding the goats. They are also used on rainy days.

- The castor seed is crushed for oil and mixed with straw to form a greasy paste for lubricating carts.

- On the bigger bunds of farms, *Prosophis* is grown for fuel.

- Feeding goats with neem leaves acts as a natural wormicide.

- In most of the garden lands invariably intercropping of onion is seen as it comes to maturity soon and is a source of income; also if one crop fails the other will support the cost of cultivation.

- To arrest soil erosion, stone pebbles (large) are packed to form a temporary check dam. Also, agave is grown on boundaries so that goats won't enter and also arrests the erosion.

- One new moon days the weavers are not weaving clothes as it is the birthday of their God - a belief. On those days they don't consume meat.

- There is a belief that since sheep are allowed to graze on open land, it is spreading lot of diseases and TB so people prefer taking country goats than sheep.

- For curing dysentry in sheep, onion, asafoetida and cumin are mixed, crushed to a paste, exposed to dew and fed to the animal.

22. Local Taxonomies and Classifications

Local Name	*Explanation*
1. Pagadai	Harijans Caste
2. Budumbar	"
3. Pandal	A support for twine like snake gourd, lablab etc. a roof like structure
4. Poricha mann	The soil enriched with dung and wine of goats gets dried up and salty after some time and this is used as organic manure
5. Pallam	A low lying area
6. Medu	An upland area
7. Sorpa Vithu	A short duration local rice variety
8. Thoposamba	Rice
9. Milagu samba	varieties
10. Seemapul	Fodder grass
11. Muttadappan	Tetanus
12. Veeduppu	Fever
13. Kanai	Cold
14. Patti/Kedai Kattuthal	Sheep penning

23. Principal Problems and Opportunities

As a result of the diagnostic PRA it was clear that farmers are farming a range of problems. These are:

- decline in fertilizer response
- *Cyperus* weed control
- erosion of top soil
- lack of registration for weavers
- Declining water table - down from 27-30 feet in 1987 to 45-50 feet in 1991
- lack of veterinary hospital
- lack of timely availability of adequate quantity of quality seeds
- waterlogging in garden lands
- non cooperation between ethnic groups
- decline in quality of irrigation water
- non-availability of credit facilities
- frequent electricity interruption for irrigation
- subsidies and other facilities are not extended to farmers
- lack of skill demonstration in village by the extension personnel
- trees pruned by others often

Two of these problems were analysed in greater detail, so as to identify options for research based both on the problems and farmers current responses.

Problem 1: Decline in Response of fertiliser applied to rice

How we learnt: While discussing with wet land farmers

Who is affected: Wet land farmers

How long is the problem: Past 5 years

Where is the problem: In wet lands

Farmers responses They apply DAP as basal urea, can as top-dressing to amounts to 22 kg/ha. as basal.

Options for research/extension

1. Fertiliser application based on soil test
2. Identify soil based problems
3. Fertiliser response varieties can be introduced

Problem 2: Cyperus weed problem

How we learnt this: farmers expressed during discussion and PRA analysis

Who is affected: Garden land farmers

How long is the problem: For the 10-20 years

Where is the problem: Coconut garden, garden lands

Farmers Responses

1. Lack of labourers to dig
2. Lack of effective chemicals
3. They dig and hand weed during summer.

Options for Research/Extension

1. Summer ploughing and removing the Rhizomes
2. Glyphosate 1 litre/acre at 15 days interval during off season.

5. PRA OF MEENAKSHIPURAM VILLAGE IN KAMARAJAR DISTRICT

R Vijayaraghavan
N Gopalaswamy
K Mohanasundaram
K Velayudham
R Ventikaswamy
S Geetha
P Sauthri
Vijay Kumar
K C John

1. Introductions and Participatory Mapping

This PRA team consisting of members of various faculties after a thorough exposure to PRA techniques visited T. Meenakshipuram village to practically experience the validity of the various PRA techniques learnt in the workshop at Regional Research Station, Aruppukottai. The team while moving to the village was made joyful by the PRA team members Dr.Venkitasamy, who was reading the palms of all and Mrs.Geetha, by her songs.

The first day began with anxieties, expectations and of course shadows of doubts. But these soon disappeared as the interaction with the villagers began. The first task accomplished was explaining the main purpose and objectives of the visit to the villagers. Many questions were asked and clarified. One member of the team climbed up the overhead tank and viewed the entire village pattern, resources, cropping systems, and other unique features which he noted down.

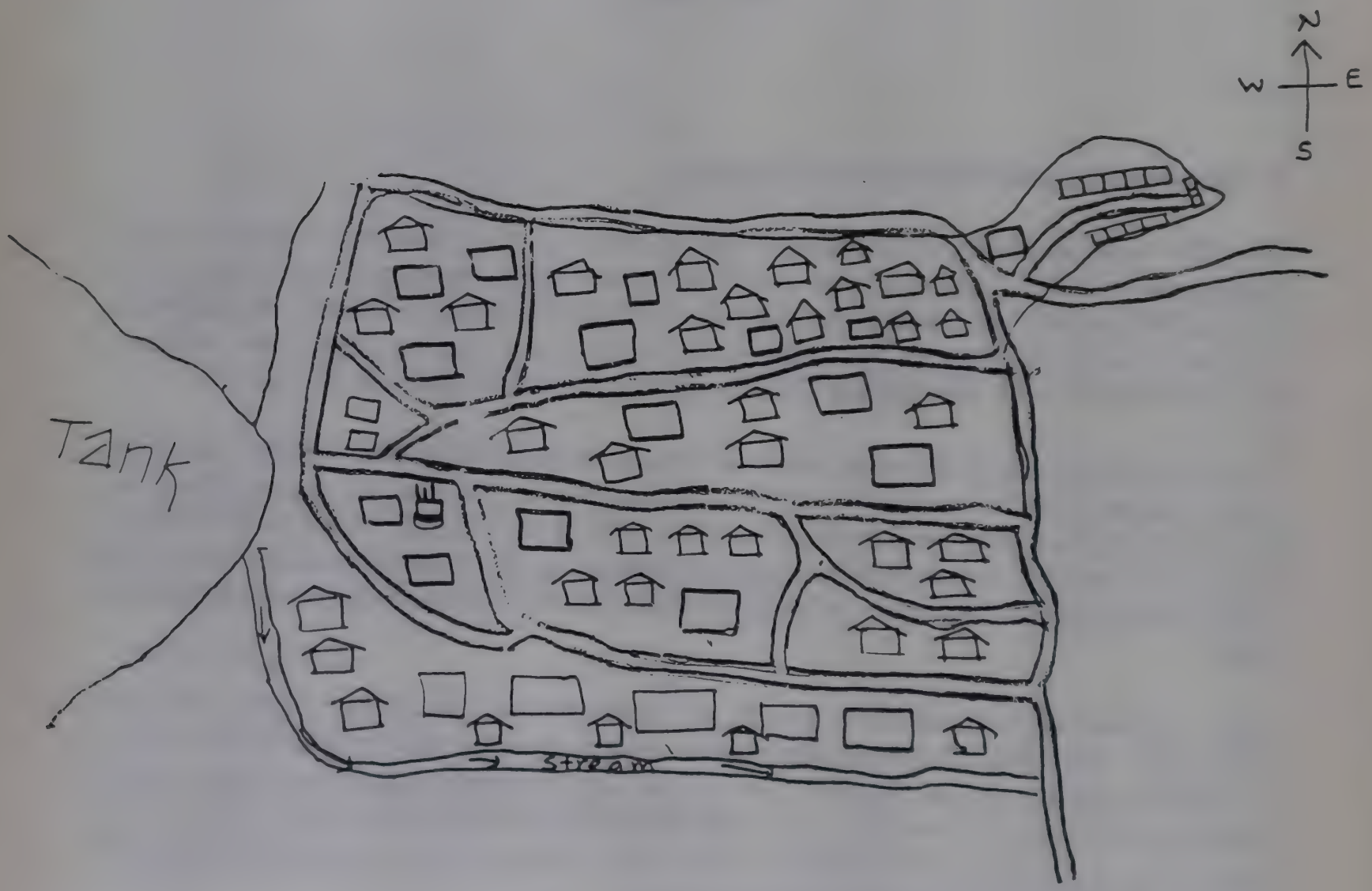
Then the team divided into two groups and went through the village streets with key informants. Semi-structured interviews were conducted on the way with men and women of different age groups and walks of life. In one such encounter a group of villagers were requested to visualise their village. A young man (35 years old) started the process with all enthusiasm, a small group was formed, which later culminated into a reasonably big group of 40 to 50 both men and women, young and old.

The PRA team members were assigned with specific tasks to be performed. When the villager was drawing the map with a chalk piece on the floor depicting the institutions, houses etc. the group members interfered quite often. When the map was three- fourth completed, the 'Eye-line' was noted by the PRA team. The school children in the group wanted the school to be depicted with thick colour and also the play ground. The women were also in the group but they were practically pushed to outer circle. In the meantime four or five youngsters went home and brought chalk pieces of different colours. The PRA team member asked one of the oldest man in the group to show his house in the map. He came to the front line, sat down, thought for a while and started from the main street and finally shown his house correctly. Then a lady member was asked to show the institutions in the village and she did it rightly. A new arrival was asked by the villagers to locate his house

on the map. This he did, with much discussion. The team noted all the eye-lines were on the map, ie people were talking to each other but not looking at each other. Another participant was asked to locate his house, but failed. He started complaining that the people who drew the map has purposively omitted his house, which he then marked on the map. Throughout the mapping the enthusiasm of the participants was very high.

The entire process of mapping the village took about 2 hours for the villagers and about an hour for further improvement on it.

FIGURE 44



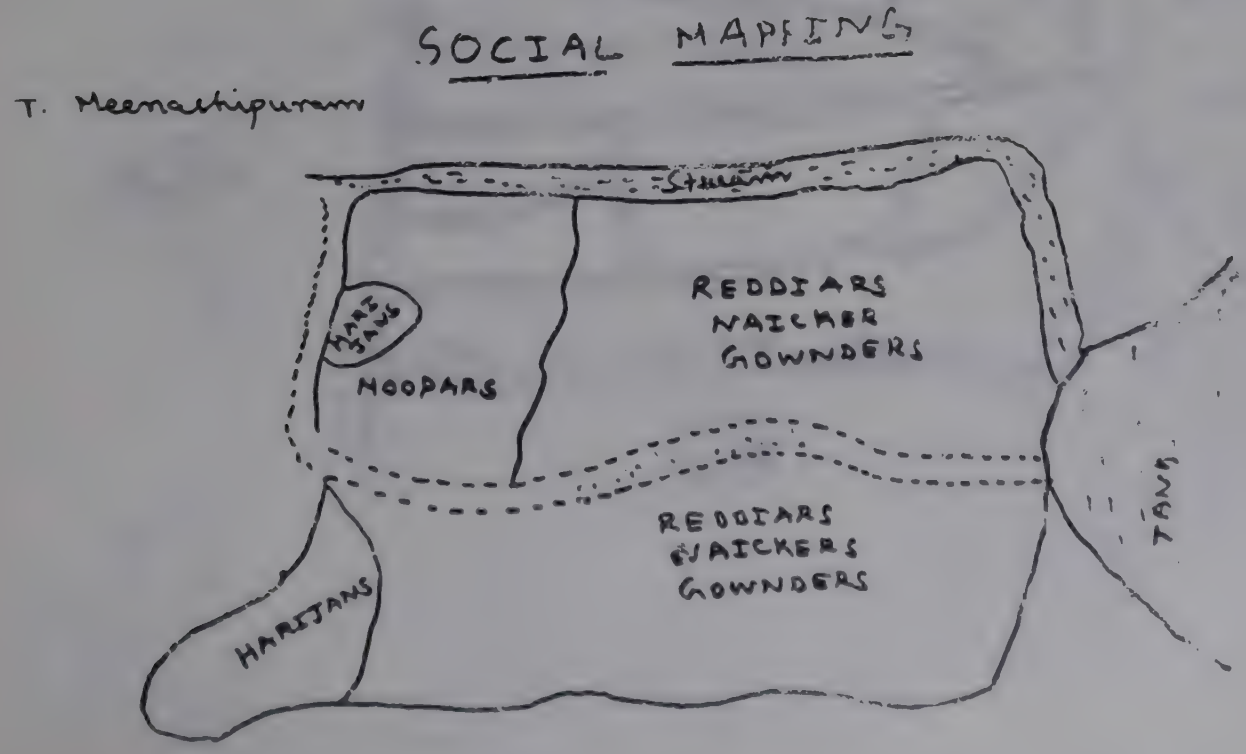
2. Social Mapping

With a view to understand the various social groups in the village a group of eight participating villagers were asked to draw the social map. During the interaction it was learnt that the communities like Reddiars, Naickers, Gounders, Moopanars and Harijans are living in the village. In drawing the social map the following steps were chronologically followed by the participant villagers:

- With the use of a three foot stick, they drew the village boundaries and village roads.
- They put the rangoli powder on the boundaries and on the line of roads with white colour for marking.
- They marked the habitats of different communities in the map and used different rangoli powders for this also. Rose was used to denote the habitat of Reddiars, green for Naickers, blue for Gounders, yellow for Moopanars and finally reluctantly put pink for Harijans.
- From the map they explained that Reddiars, Naickers and Gounders are living together whereas Moopanars in a separate group and Harijans as an elusive sector in the village.

Despite repeated requests it was not possible to find out the number in each group. With the help of secondary data collected by the PRA team their proportion was found as 40% Reddiars, 30% Harijans, 10% Naickers, 10% Gounders and 10% Moopanars. The villagers impressed upon the PRA team that they were not interested in such counts.

FIGURE 45



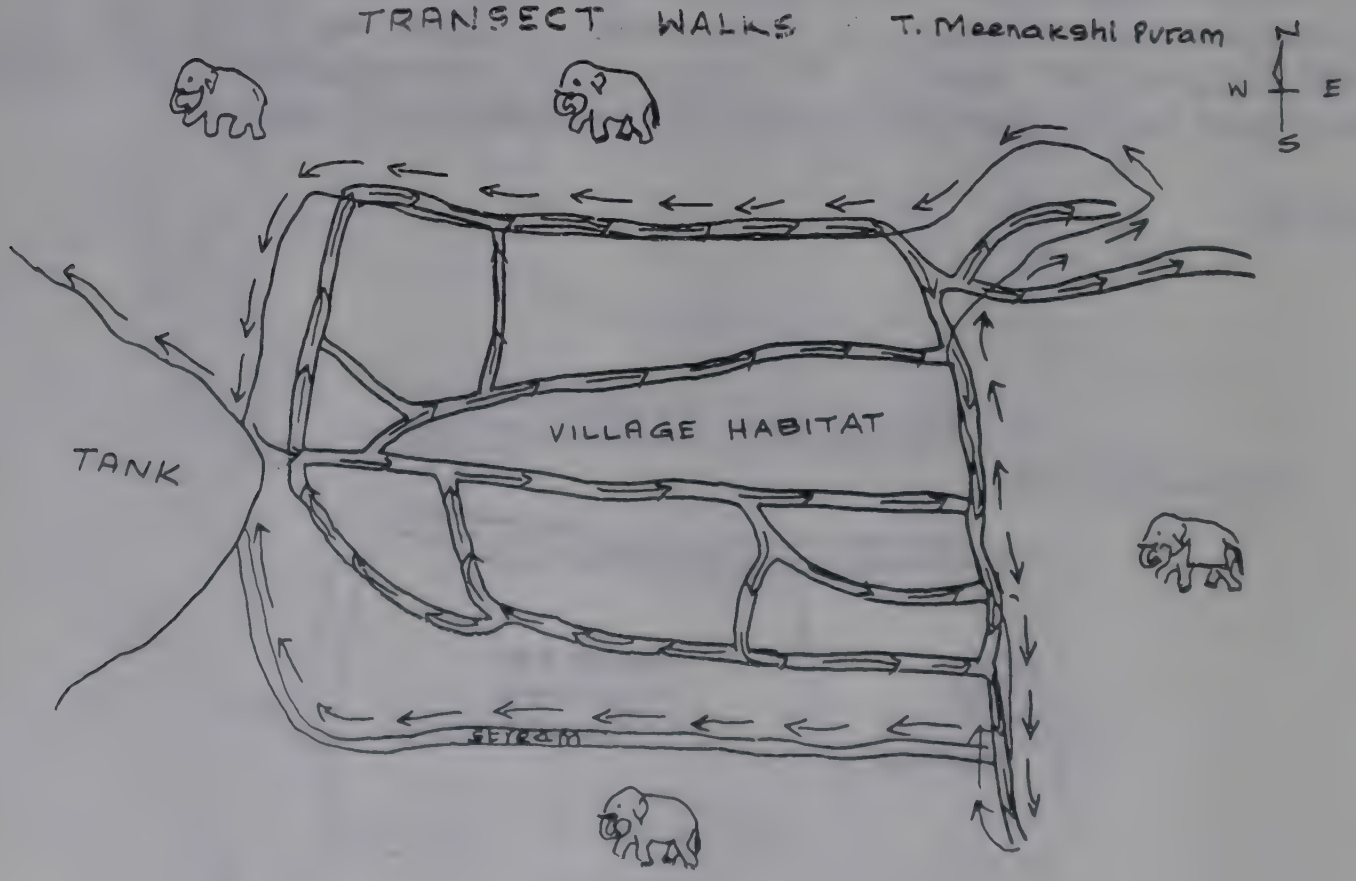
3. Transect Walks

When the team was transecting in the village, a group of farmers were threshing greengram pods. The team members greeted them and sat on the platform. The team saw some of the goats were being fed with green grasses and plants. This method looked new to the team. So the topic was diverted to the availability of fodder.

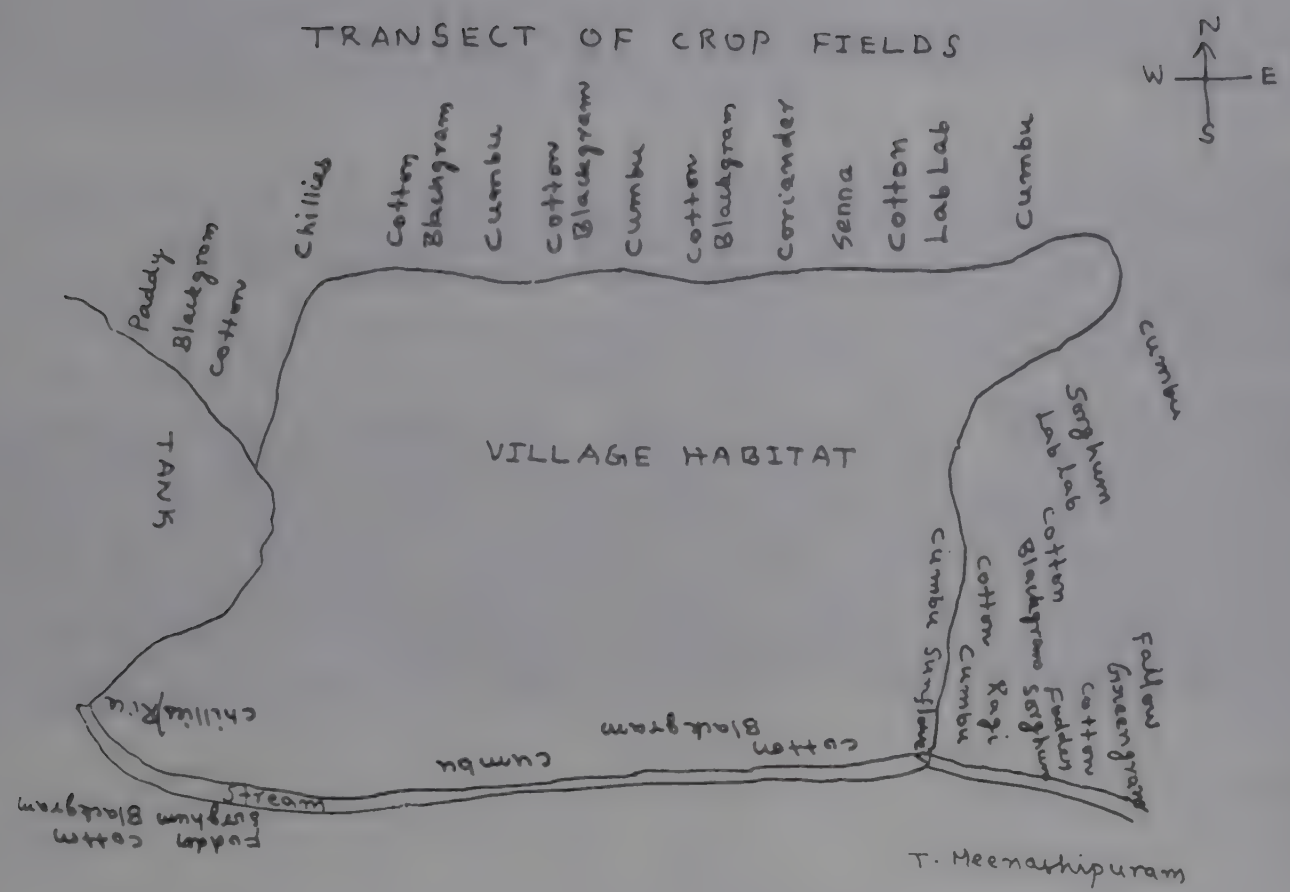
The discussion with the farmers revealed that they have only local breeds of goats since they are not aware of any other breeds. The goats were fed with green grasses and plants collected from road side and field side area. It will be available in plenty in rainy season. During summer due to scarcity of fodder goats will be let in the fields and weeds like manjanathi were collected and fed. It was inferred from the villagers that there are about 20 milch animals in their village. This number was not agreed upon by some villagers. All of villagers are the not owning milch animals because they have no time to look after the animals during crop season. Sorghum and greengram haulms grown in the field are fed to animals. During scarcity period the weed manjanathi is fed.

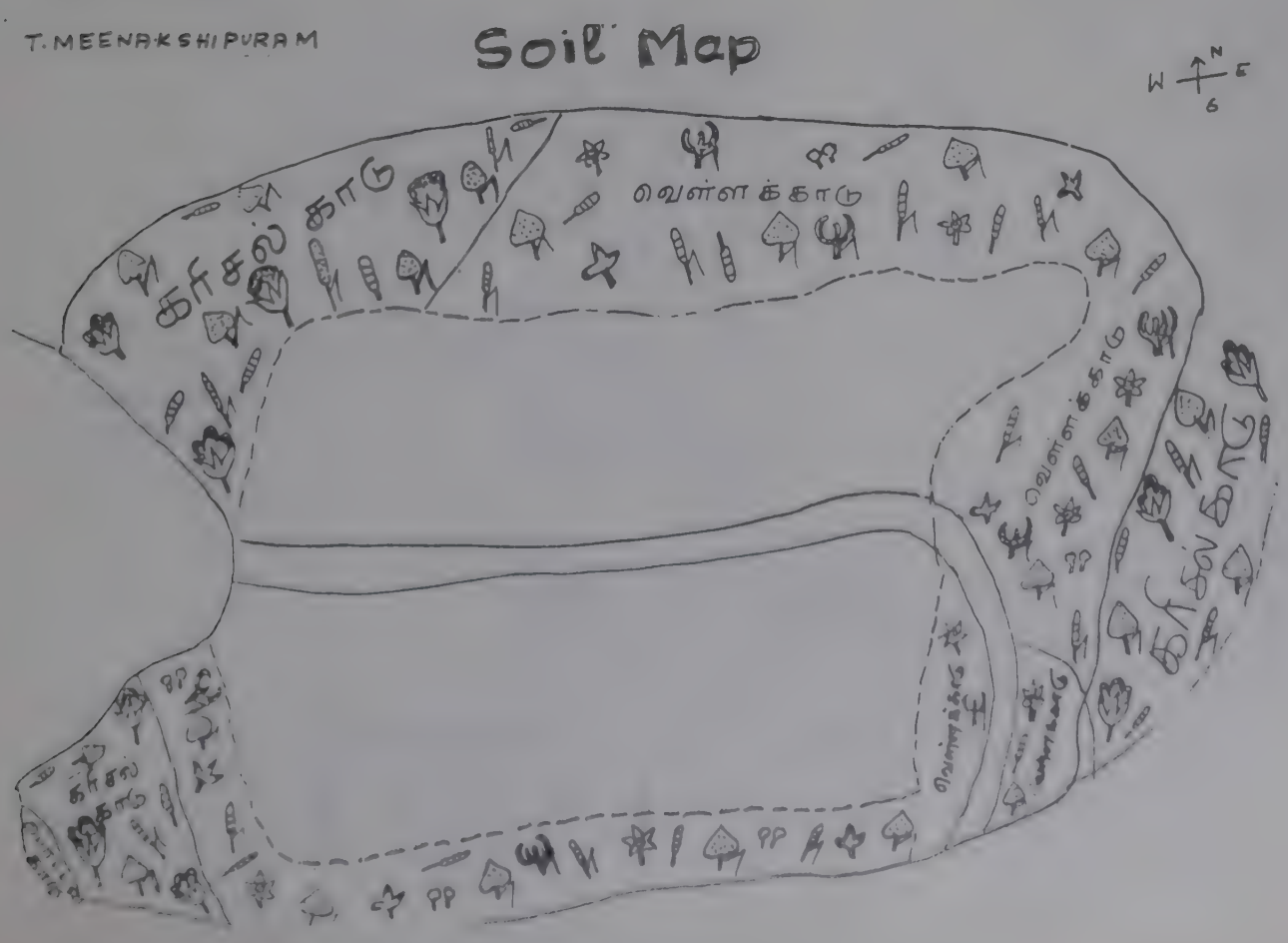
Further transect walks focused on the crops growing in the fields, producing a detailed crops map, and soil types, producing a soils map.

FIGURE 46



FIGURES 47, 48





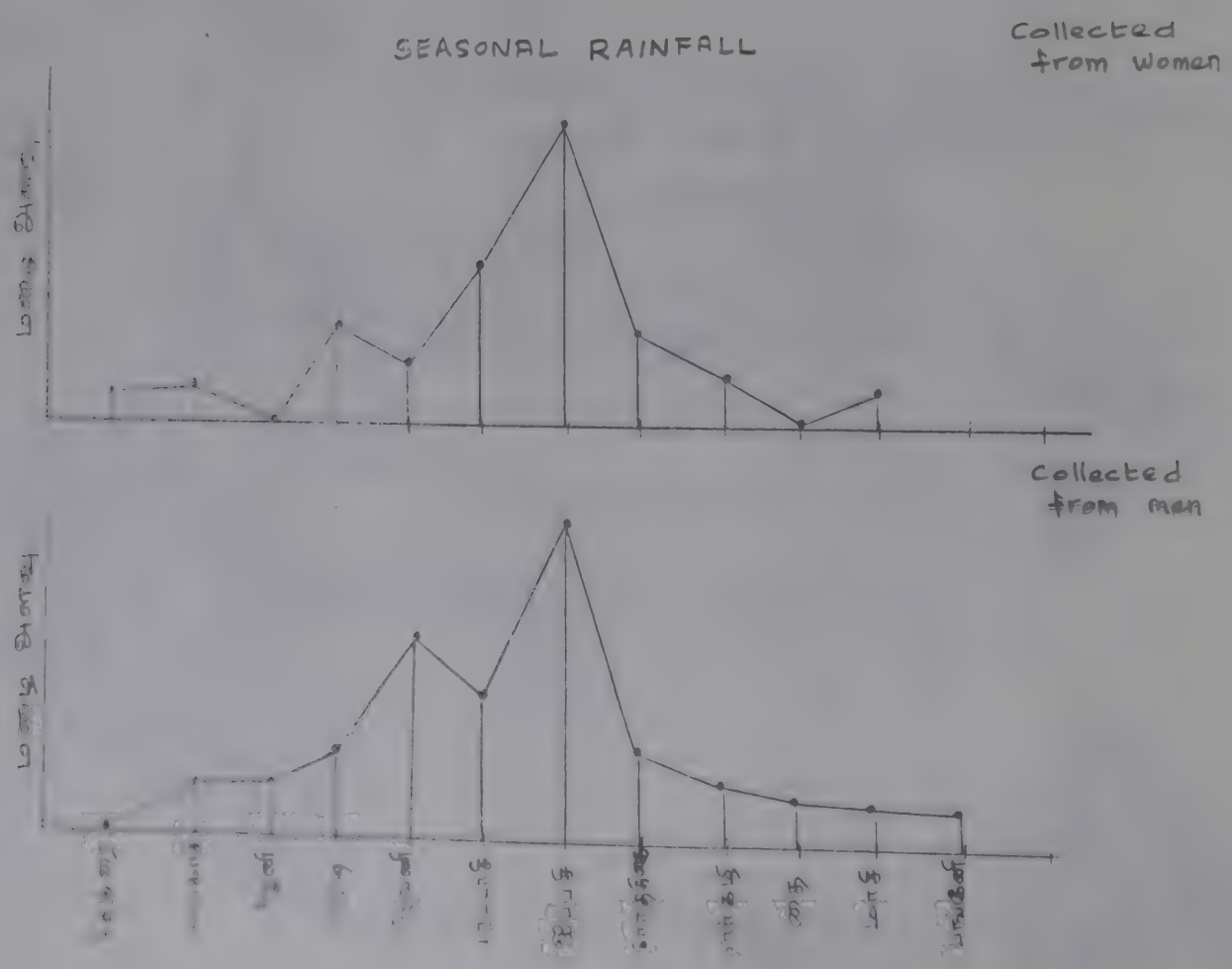
4. Seasonal Calendar: Rainfall

These methods are drawn to express their understanding of local livelihood systems. The pattern of monthly rainfall was one such items which was expressed by the men and women groups separately. Three men and two women were interviewed separately and gave the monthly rainfall pattern of their village T.Meenakshipuram for the past 20 years. They sat down comfortably on the ground and utilised the cholam straw and cowpea grains to indicate the quantity of rainfall received during every month. The following questions were asked by the PRA team:

- During which month the rainfall will be more in a year?
- What are all the months in which you usually receive maximum rain?
- Please specify the quantity in those months?
- In which months you don't receive any rain?

For these questions they were asked to show the answers through diagrammatic representation on the ground. Observations (Men's group): as per the stick drawing made by the men group it was observed that maximum rainfall was received during October followed by August and September. The rainfall starts from the month of May and extends up to August with an increasing trend. North east monsoon (October and November) received the maximum rain fall. Observations (Women group): this group also expressed the same trend in the receipt of rainfall.

FIGURE 49

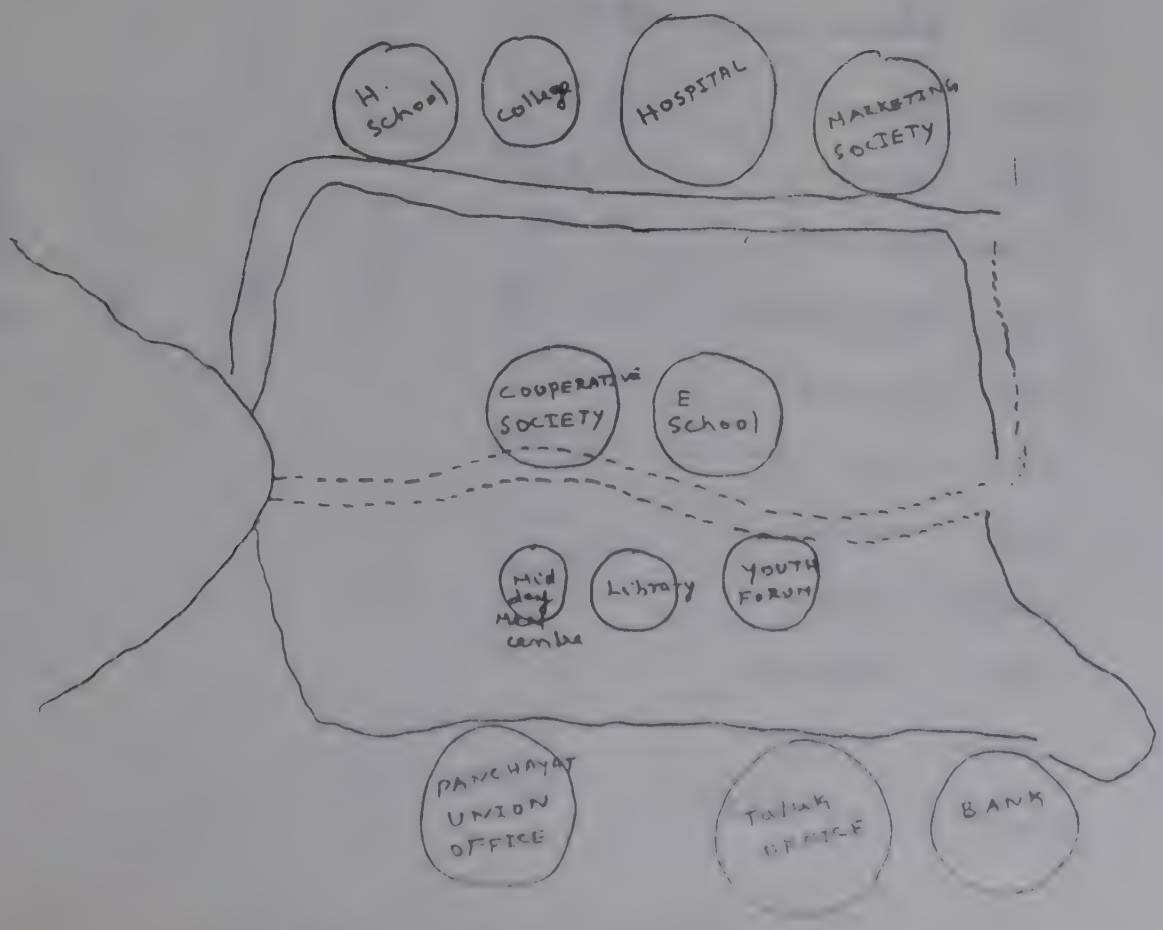


5. Venn Diagram for Institutions

To understand the present formal and informal institutions in T.Meenakshipuram village and the degree of interaction among these institutions in the perception of villagers, the village youth were requested by the PRA team to do this exercise. Due to the initial rapport created already they readily came forward. They drew the village boundaries and roads with white chalk obtained from the youth club nearby. Two individuals brought scissors and white paper to make squares to show the various institutions.

First, they put the elementary school (big square) inside their village boundary followed by cooperative society and youth forum. When asked by the PRA team to elaborate on the last institution depicted, they said that their village consists of a forum of five senior villagers of repute who decide on the punishments for any thefts etc in the village and it seems to work well as an informal social control mechanism. The PRA team asked the youth to show the institutions outside the village boundary. High school, college, hospital, marketing society, panchayat office and bank were depicted by them in that order. When asked to show the importance of the depicted institutions, the youth collected different sizes of stones and but the bigger ones on elementary school and library and smaller ones on taluk office. The interactions among institutions were also shown by them by connecting the interrelated institutions with sticks of various sizes, the bigger and thicker ones for greater interaction and smaller and thinner for least interaction. The entire process took about two and a half hours.

FIGURE 50



6. Seasonal Calendars for Employment Patterns

The PRA team in the course of study met a Harijan family and made an encounter to understand their employment pattern in a year. The elderly man of the family initially took sometime to understand the purpose explained by the PRA team members.

For depicting Tamil months sticks were used and the first month was told as *thai*, quite contrary to the expectations of PRA team, ie *chitrai*. The employment pattern was depicted by greengram seeds. The number of seeds indicated the level of employment in that particular month. It was seen that during *thai, vaikasi, adi* and *markali* employment was more and the lean months were *puratasi* and *panguni*.

In another encounter the PRA team tried the same process again. While the team was walking along the roadside one woman was sitting in her house. The team after informal introduction had casual discussion about rain, weather etc. Meanwhile ladies from other houses came outside to watch and slowly took part in the conversation. The PRA team members when asked about the employment opportunities they said that from September to December the womenfolk of the village have employment. When the other member asked the women to depict the level of employment then they put ten stones for peak months, ie. December and January. She was able to give a good picture of employment for various months by placing different numbers of stones.

FIGURE 51

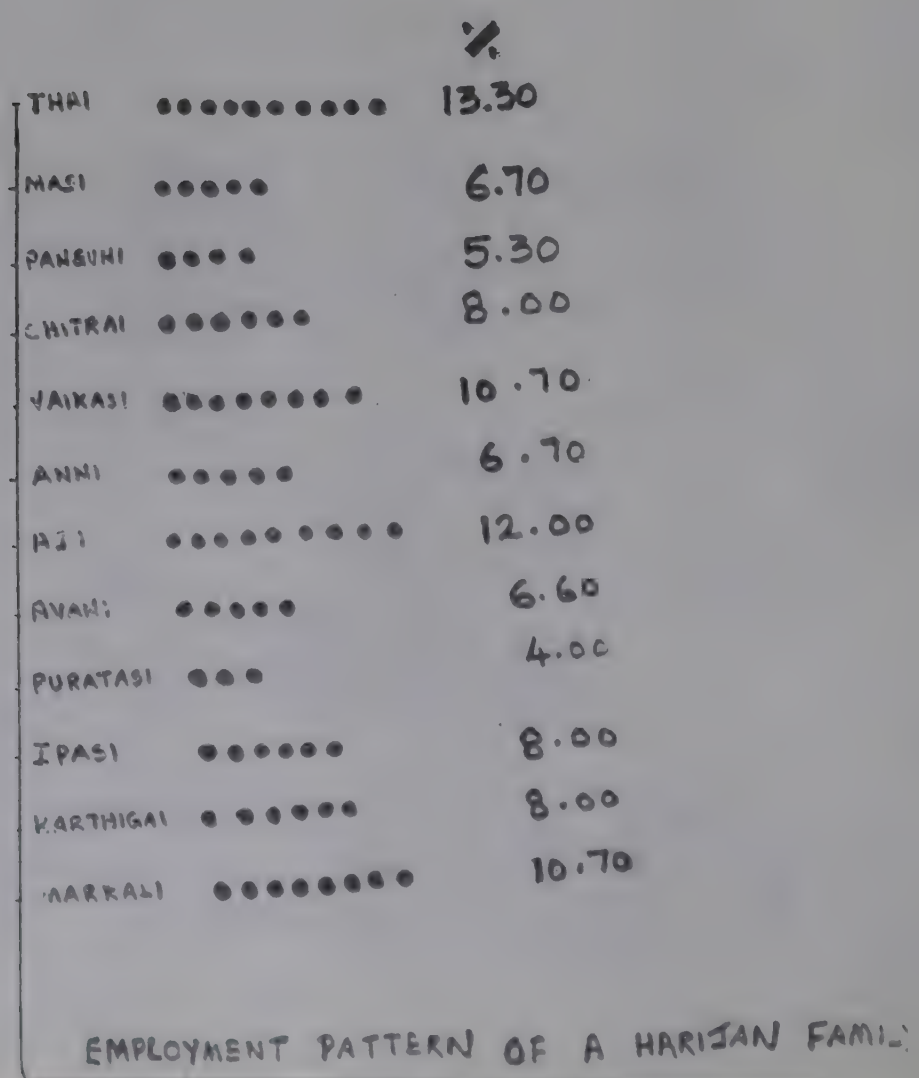
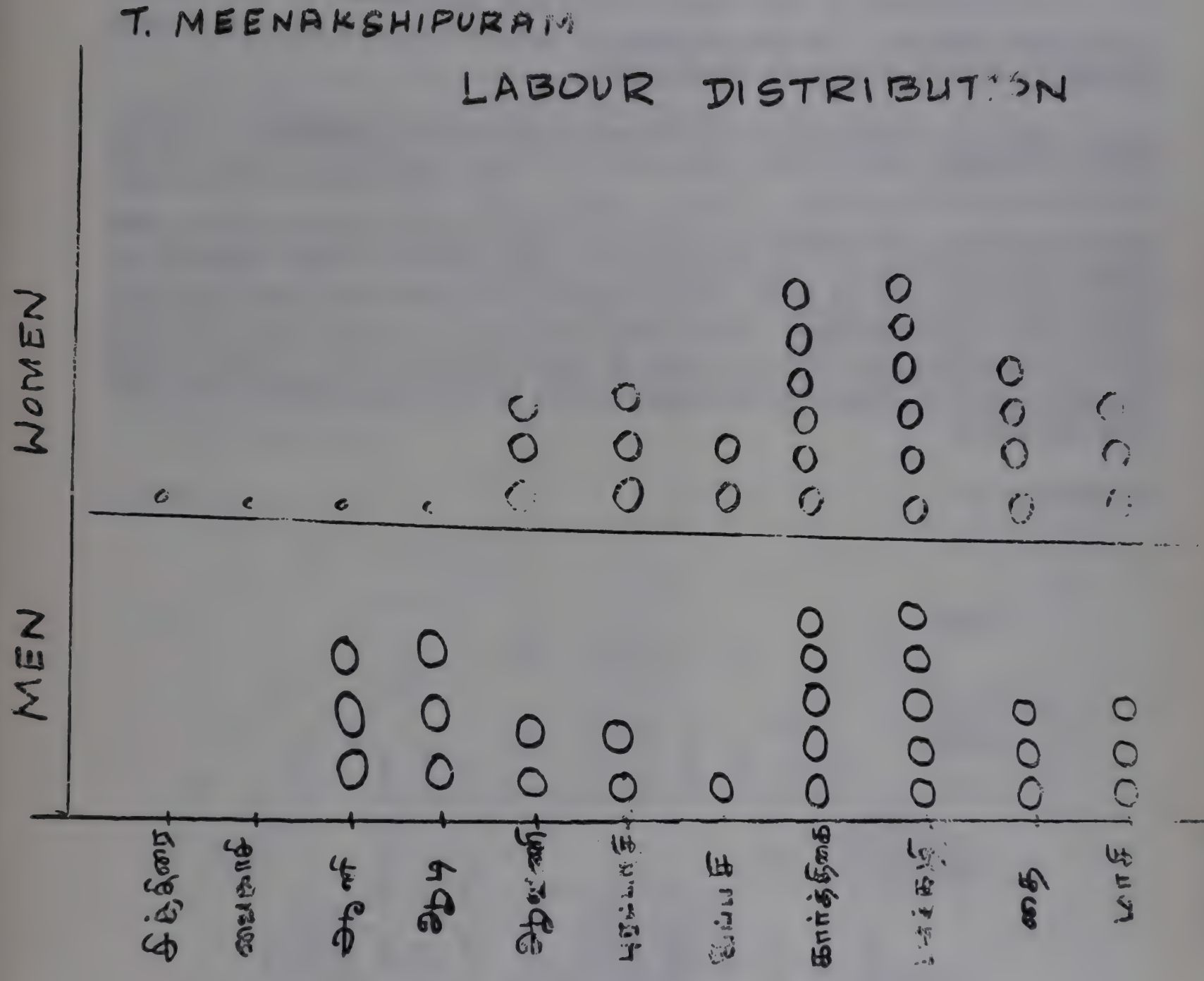


FIGURE 52



7. Seasonal Calendars: Income, Expenditure and Credit

The pattern of income, expenditure and credit needs of the farmers of the village was enquired in detail with male and female members of the village. Both the groups used stones to indicate the quantum of income, expenditure and credit needs. Initially a straight line was drawn on the ground with all Tamil months written with equal distance by both men and women groups separately. Then the team requested them to depict with stones the income, expenditure and credit needs of the various months.

As far as the receipt of the income with reference to agriculture is concerned, December, January and February were the three months which provided income to both the groups due to the harvest of pulses and cotton. There is a slight increase in the income during February for the men group. The expenditure for the agricultural activities started from May and extended up to February for both the groups with slight variation during September and February compared to women group. As far as the credit need is concerned, both the groups required credit during September, October and November. For men group income from agriculture constituted about 50% while wage earning from match industry and agricultural work constituted 30%. The income from goats, poultry and buffaloes constituted about 20% of the total income.

FIGURES 53, 54

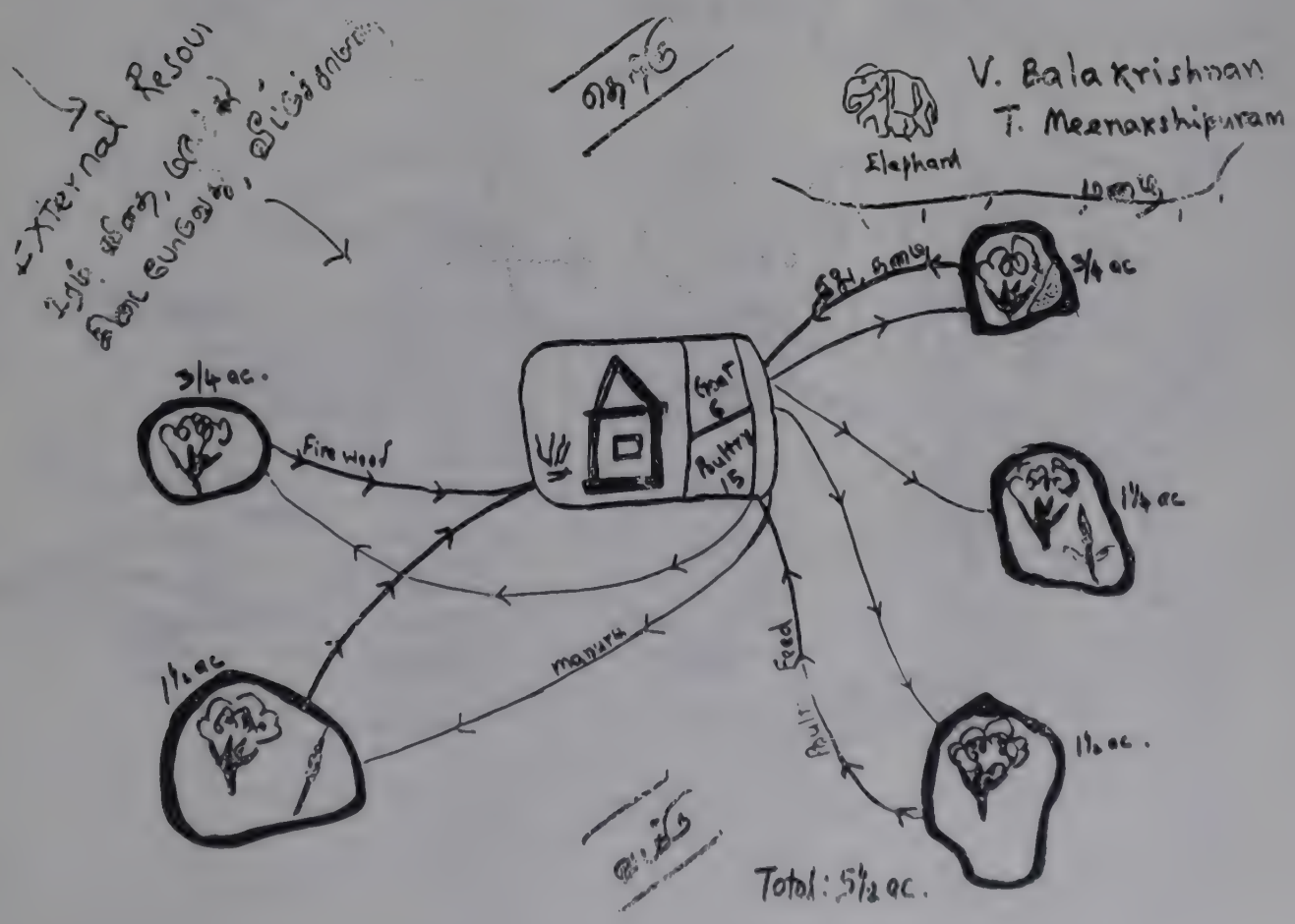
8. Systems Diagram and Resources Flow Chart

In order to understand the flow of various resources within the farm and home, a men's group was requested to map out diagrammatically and the farmer Mr.V.Balakrishnan came out voluntarily to start the process. About 20 farmers and children were around.

The farmer preferred the floor, cleaned the space by himself and with the help of a four feet stick started the picture. He first depicted his house describing how he built his house 20 years back. Then he pointed out his five farm holdings chronologically. When asked about the basis, he said that according to the time of purchase of the land and so field No.5 denoted the land holding he purchased last.

He first marked the lines flowing from farm to home in the order of goat feed, poultry feed and firewood. Then home to farm namely, goat and poultry manure. The other members around pointed out that firewood was the main item which they got from their farms. When asked about the external resources they received from outside their village, the farmers mentioned fertilizer, seed, pesticide, sheep penning, and household articles. The grains and crop products were going out of the village without any value addition. It took 40 minutes to complete this process.

FIGURE 55

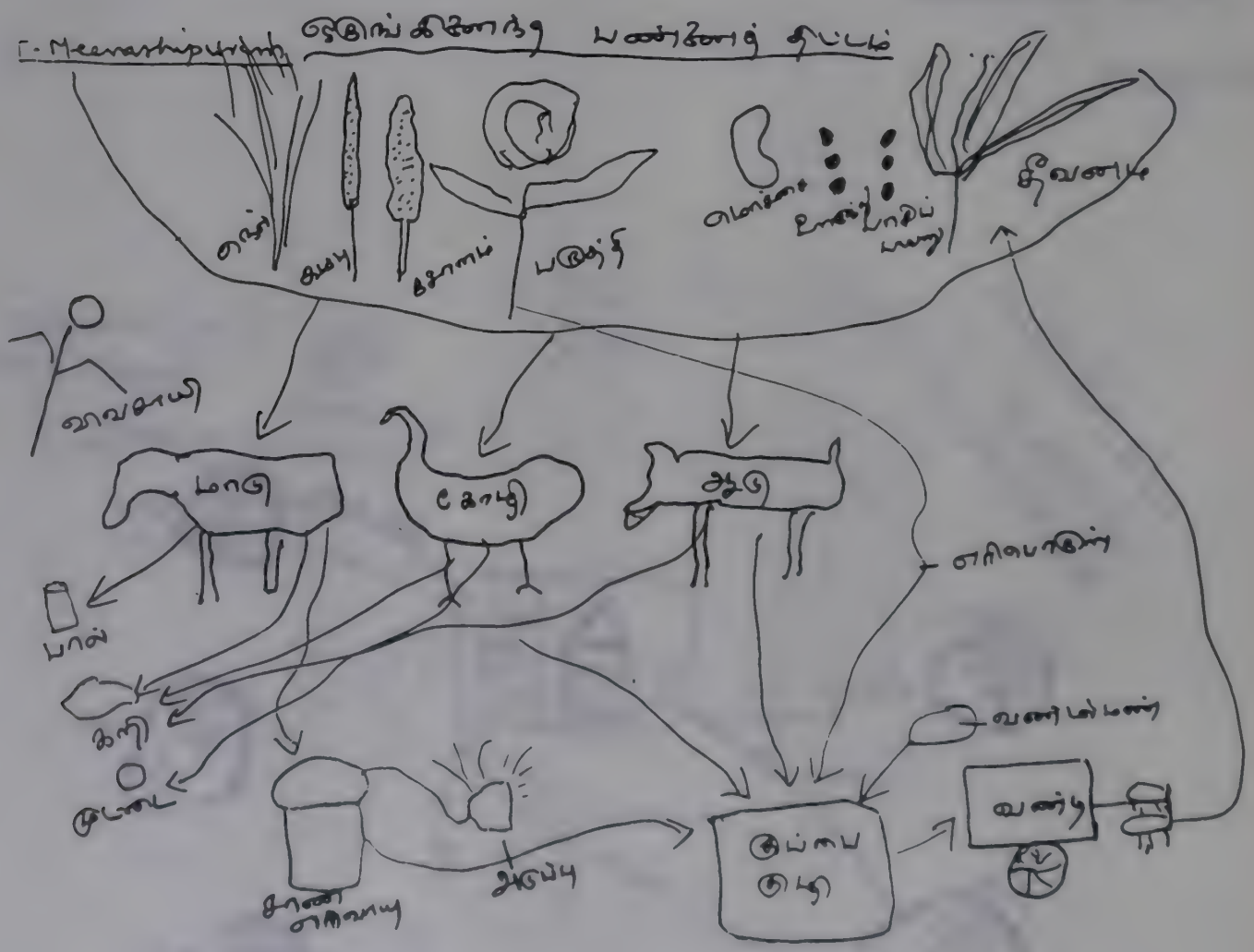


9. Systems Diagram by Women

The perception of the village women on Integrated Farming System was studied by the team. Three woman came forward with their children and agreed to show pictorially. The woman started with the picture of a cow followed by poultry and goat with green rangoli. They showed the products they got from cow, poultry and goat as milk, egg and manure. Then they pointed out the various grains as feed material for these livestock. Finally one woman in the group who was standing behind came to the front and draw a line from cow to the gobar gas. When the PRA member asked why, she replied that one gobar gas plant was existent and went out of order afterwards. At this juncture many joined in the discussion expressing the various problems of gobar gas plant.

This diagram is a reproduction of the drawing made by the villagers.

FIGURE 56



10. Historical Profiles and Time Trend

The PRA team interviewed a few octogenarians to elucidate information on chronological changes in agricultural area and cropping pattern over a period of time period. The farmers were requested to show the change in cropping at 10 year intervals from 1940. The year 1940 coincided with the birth of the first child of Mr.Periasamy Reddiar, a 85 year old man of this village. The interpretations from the diagram drawn by chalk on the floor is as follows.

- Area under cotton remained almost constant (25%) from 1940 to 1960. Then an increase in cotton area by 5 and 15% during seventies and eighties respectively.
- Minor millets, varagu and Kuthiraivali, were cultivated during 40's and 60's and the area got gradually reduced to nil during 90's. The reasons attributed were chances in food habit and women's refusal to grind minor millets.
- The area under sorghum reduced by 25%.
- During 1950's and late 70's groundnut area was reduced to 50% and its cultivation became extinct later due to fox menace.
- Crops like sunflower, coriander and senna gained entry into the cropping systems in the 80's.

FIGURE 57

HISTORICAL TRANSECT

T. Meenakshipuram

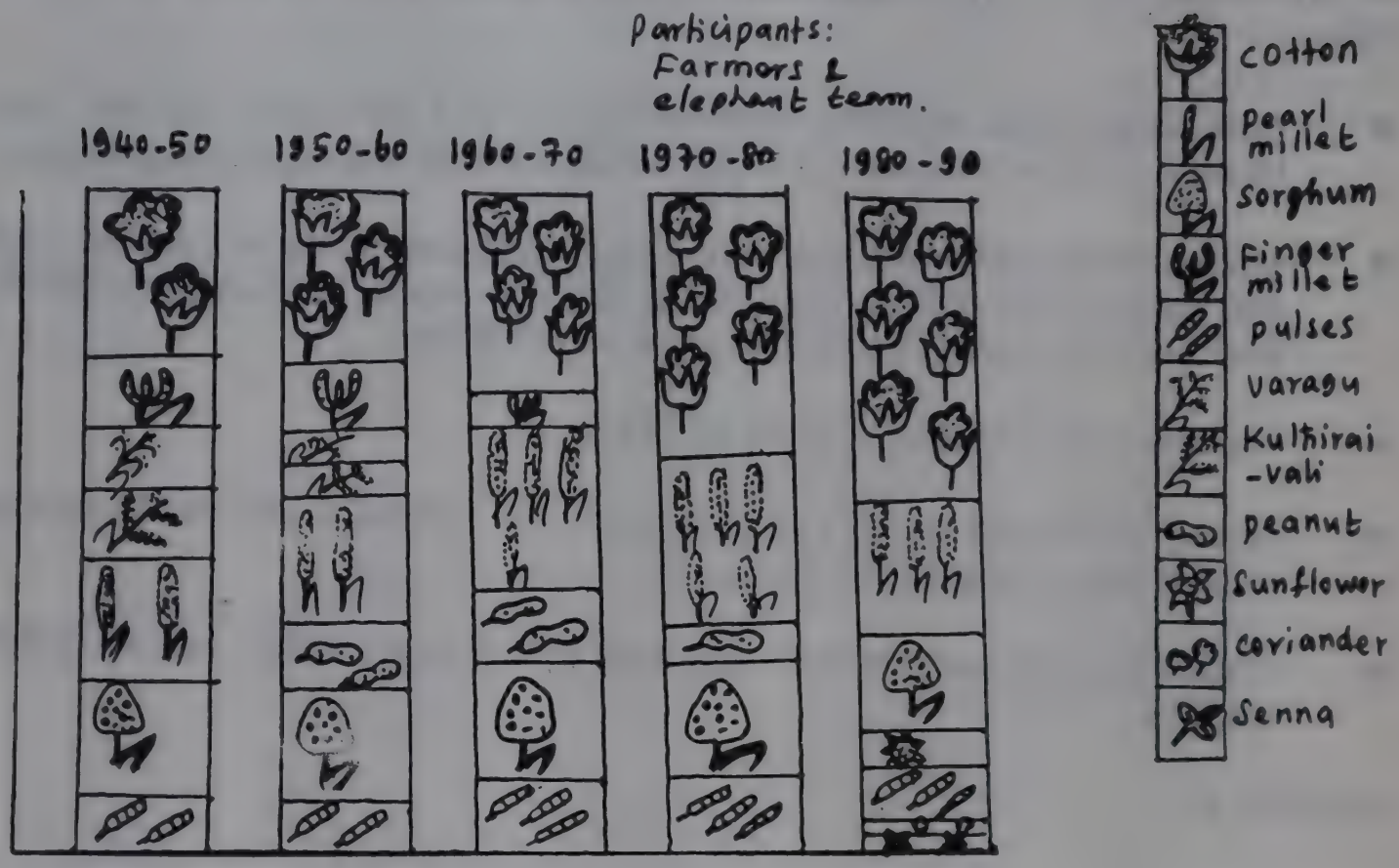
participants: Farmers and elephant group.

Year \ crops, animal, F. power, yield	cotton	Pearl millet	Sorghum	Finger millet	Green gram	Bullocks	Tractor	Yield.
1940	Karungani local	Nattucumbu local	chenj cholam local	Natty kappai local	Poovani local		-	
1970	Karungani local	local	local	local	local		-	
1979	Lakshmi improved	Improved	improved	local	local & Anjugam			
1989	LRA 5166	Maharashtra WCC 75 local	CO.4 K-tall local	local	local Anjugam			
1991	LRA 5166	WCC 75 X-10 local	K-tall local	local	local Anjugam			

(Hire)

Historical transect for crops, animals, farm power and yield.

FIGURE 58



Decadal diversification of crops on the rainfed land of T. Meenakshipuram (1991)

11. Local Practices and Beliefs

The following indigenous practices and beliefs were found from the discussions held with the farmers by the PRA team. These practices were developed and time tested to increase and sustain crop production and to cure some of the common ailments.

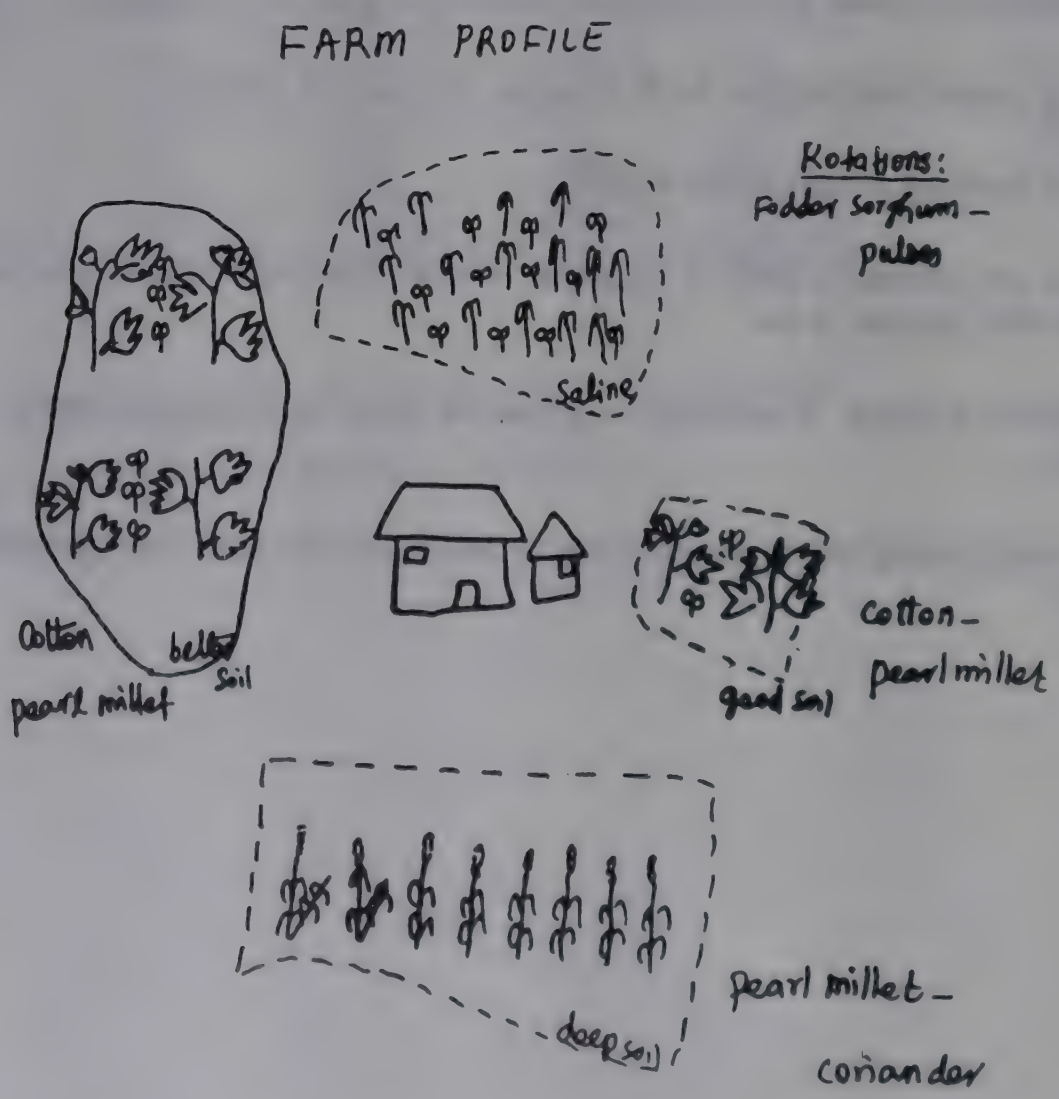
- Crushed neem seed extract is used to spray on crop plants, especially cotton, as a pest control mechanism.
- Goat pellet powder mixed with seeds and sown to improve germination.
- Pesticide use has eradicated *Striga* - a parasitic weed on pearl millet.
- Decoatation of Manjanethi (*Morinda* sp.) and Kolinji (*Tephrosia purpurea*) are administered to treat stomach problems of humans.
- Coriander sown in late *karthegai* (November) escapes from dew injury and yields more.
- Application of tank silt is very good for crops. Tank silt is used to cover manure pits.
- Tying snails shell around neck prevents abortion in goats.
- Sheep penning brings more wealth.
- Goats are primarily kept as economic buffer. They are sold during summer months when the income is low.
- Sorghum fencing: if sorghum is grown in thick stand around cotton fields it saves cotton.
- Growing blackgram in an intercrop is better for the next crop compared with green gram.

12. Farm Profile

The PRA group had lunch in one of the farmers house and asked him whether his farm is nearer to the house. He told that on all the four directions he has got his land holdings. He raised cotton, pearlmillet, fodder sorghum and pulses in his farm. When asked to show the location of fields he started giving information verbally showing the directions using his fingers on the floor, imagining his house in the centre. The team suggested him to use the chalk piece so that it would be visible.

He happily got the chalk piece and started drawing his house in the centre and marked the four fields around the house using different colours for different fields because each one varies in fertility and crops grown. For fertile lands he used green where he had grown cotton. He used yellow to indicate medium fertile and red colour for deep soil where pearl millet and coriander were grown alternatively. He used rose colour to show the saline patches where he grew only fodder sorghum and pulses alternatively or as intercrops. With this colourful diagram he was able to give an account of his fields and suitability of crops for different fields.

FIGURE 59



Farm profile of Mr. Pal Pandian's farm
T. Meenakshipuram.

13. Matrix Scoring: Cotton Varieties

The topic of interest in matrix ranking and scoring are the comparison of cotton and field bean varieties. Cotton forms the major cash crop grown under rainfed condition. Interactions and deliberations brought out that there had been drastic changes in the varieties and other cultural practices in the production technologies. This was evaluated through the practice of matrix ranking. The parameters for evaluating the production efficiencies of different varieties were set by the farmers themselves. The farmers considered the following parameters:

- Duration: as a rainfed crop the growing period should match rainfall distribution to have maximum efficiency.
- Boll weight: this is considered as major yield contributing factor.
- Response to manuring: in rainfed crop the response depends on rainfall and soil moisture availabilities. This has to be precisely evaluated in view of cotton being a heavy fertilizer crop.
- Ease of picking: this criteria was chosen because the number of pickings influenced the cost of cultivation and also depends on labour availability.
- Facilitates intercropping: the farmers considered this as an insurance against erratic rainfall and also to get some income to meet the cultivation expenses of the main crop.
- Yield: the ultimate criteria of the farmers is the net monetary return.

During matrix evaluation in cotton the following steps were followed. Karunganni cotton was represented by a cotton leaf, Lakshmi cotton by cotton flower and LRA 5166 with a cotton stem. The preference for each of the criteria was represented by black gram seeds. The larger the number of seeds, the greater the magnitude of preference for that criterion. From the matrix chart it was found that LRA 5166 variety was considered superior in view of higher yield, boll weight and net return, even though it is not very resistant to pests. Lakshmi was preferred to Karunganni on most criteria, but again was less tolerant to pest damage.

FIGURE 60

MATRIX RANKING

T. Meenakshipuram

Participant
Mr. Dal pandian

Var. / Cri.	COTTON VARIETIES		
	Karunganni	Lakshmi	LRA 5166
Duration	X X X X X X X	X X X X X	X X X X
Bolls / plant	X X X X X X X

14. Matrix Scoring: Field Bean Varieties

Another matrix scoring for field beans (*Mohani*) was done by women farmers. They compared three local varieties, black, white and red. As perceived by them the most important criteria were less duration, drought tolerance, yield, and taste. The matrix ranking was done using bean seeds. This process took about half an hour for men and one hour for women farmers. The most important criteria appeared to be taste.

FIGURE 61

Criteria	LOCAL VARIETIES Black	White	Red
Less Duration	★★★ ★★	★★★ ★★	★★★ ★★
Drought Resistance	★★★ ★★	★★★ ★★	★★★ ★★
Yield	★★★ ★★	★★★ ★★	★★★ ★★
Taste	★★★ ★★	★★★	★★★ ★
over all scoring	★★★ ★★	★★	★★★ ★

15. Analysis of Problems and Framework for Research Focus

As a result of the PRA diagnosis in Meenakshipuram, some 14 key problems were identified. The actions necessary to tackle these problems were then identified according to a framework involving on-station research, on-farm research, technology verification, and technology dissemination.

As part of this analysis, one issue was taken forward in greater detail.

Problem: Brackish Water Use and Soil Management

How was the problem identified?

- During the transect of the village, direct observation of salt encrustation on soil.
- Semi Structured Interviews
- Tasting of water
- Triangulation

How long been a problem?

- past ten years

Where is it a problem?

- groundwater and soils of western side of village
- soils away from tanks

Farmers' responses and achievements?

- farmers apply organic matter and tank silt
- resort to growing of Ragi and other cereals

Options for On-farm research

- analysis of water and soil quality
- on farm trials
- research for area specific

FIGURE 62

T. Meenakshipuram

FOCUS

S.No	Problems	Research			Extension	
		On Station	On Farm		Technology verification	Technology dissemination
			Exploratory	Technology generation		
1.	Soil Erosion	Lesser grass as a vegetative barrier	–	–	–	
2.	Non availability of varieties of greengram & blackgram	–	–	–	–	✓
3.	Non availability of fodder	✓	–	✓	–	–
4	Weed Management	–	–	–	–	✓
5	Incapabilities of the farmers to purchase improved breeds	–	–	–	–	Extension & finance support
6.	Plant Protection	–	–	–	✓	–
7.	Water Management	–	–	–	✓	–
8.	Management of organic matter	✓	–	–	–	–

T. Meenakshipuram

S.NO	Problems	Research			Extension	
		On Station	On Farm		Technology verification	Technology dissemination
			Exploratory	Technology generation		
9.	Cultivation in waste lands.					
10.	Lack of improved farming systems.	–	–	✓	–	–
11.	Higher cost of cultivation	✓	–	–	–	–
12.	Labour employment	–	✓	–	–	–
13.	Calcareous soil Management	–	–	✓	–	–
14.	Lack of alternative land use systems (Technology)	–	–	✓	–	–
15						

APPENDIX A: WORKSHOP PROGRAMME AND DETAILS OF TRAINING PROCESS

1 - 11 December, 1991

DAY 0: SUNDAY

1700-1800 Participants arrive at regional research centre

1830 Introduction to the workshop

1835 **Expectations and Hopes exercise**
In pairs participants interviewed each other to find out their hopes and expectations for the workshop. Reporting back took 35 minutes.

1935 Summary of workshop programme

2000 Break for evening meal.

DAY 1: MONDAY

0810 **Opening Ceremony** (attended by Dr S Chelliah & Dr Pothiraj, Director of Aruppukottai Regional Research Station)

0850 Break. During the break the adjoining room was prepared for fruit salad exercise.

0905 **Introduction to Systems Concepts** (K C John)
What constitutes improvement?
What part of the system is being improved?
Who decides? How is it decided?
What is the effect of improvement on the rest of the system?
How to move from the "farm as a researched system" to the "farm as an action researching system".

1040 **Introduction to the Gender Variable in Agricultural Research** (Nancy Axinn)
Farm system as it affects men and women. Various exercises on the board, disaggregating agricultural and household activities according to who did each. There was a process of agreement and then dissention, for example, as participants said "only women, no men also". Became personal, and made point very well - who decides, who controls, who has access? We cannot generalise.

1120 **Milch Buffalo Seasonal Calendars**
7 groups formed where participants were sitting. They analysed the calendars to guess which had been drawn by the husband, and which by the wife. Raised many issues during discussion.

1135 **Introduction to Principles of PRA**
Introduction to emphasise 6 principles, particularly learning processes, flexibility and group work. Used two exercises:

Watch game: cover your watch, pick a couple of people to describe their watch faces. Which is done with some confidence, only to be proved wrong. To great amusement. The learning

point is the need to be open to learning, and that we do not see what is not important to us.

Rucksack game: One resource person gave instructions to another on how to put on the rucksack, but he was standing in front of me and could not see the results of his instructions. Deliberately one puts the rucksack on upside down and stuck on his head. It was then repeated with the other able to observe and give feedback. This lead to some discussion on instructions without feedback, of accountability, and of involving recipients of messages fully in the process of implementation.

1200 **Fruit Salad**
At the end of the presentation everyone was asked to move next door and take a seat. This exercise was greatly enhanced by having another room, rather than have to rearrange the main room. Everyone was quiet and hesitant at the beginning. Very soon they were all laughing and joking, and were really relaxing for the first time in the workshop. Participants sat in their 5 fruit groups on return to the main room.

1210 **Introduction to Semi-Structured Interviewing**

1220 **Pictures Game**
Groups analysed 6 pictures of interviews per group, and wrote out do's and don'ts on large paper. Presentation of do's and don'ts, followed by good discussion. Then showing of selection of slides and further discussion. Before lunch, paper taped to wall as part of continuous exhibition.

1430 **Participatory Mapping and Modelling**
Groups still sitting in their fruit groups. Introduction using 35 slides of various map-modelling situations from 7 countries in Asia and Africa. Two resource people (Jayakaran and Devavaram) had opportunity to discuss two cases from Bihar and Tamil Nadu. Slides of transect walks also shown.

1515 Broke into 5 groups, allocated to key informants. Task was to conduct transect walks of the campus, then make map-models. Most groups began by going up onto the roof to begin interviews and observations. One group began map-model by 1600, the last by 1630 (these had walked the furthest, and had the least time to complete the map).

1705 Presentations began. All participants circulated around the 5 map-models. All intensely competitive, with strong ownership of own efforts. During discussions efforts were made to draw out major lessons learned form each, both good and bad points. This forum was used to talk about the story without the middle, time management, transferring the results to other media, wealth ranking, transect walks or drives (One group was proud of having used a jeep, until everyone else pointed out what they missed by driving), materials, interviewing the map and reasons for choosing colours.

1755 **Buzz session**: each group asked to consider 2 questions:
What did you learn from this exercise?
What would you do differently next time?

1825 End

1830 Planning meeting between resource people

1940 **Participatory Research with Women Farmers video**

2015 Distribution of resource books of key readings. Evening meal.

DAY 2: TUESDAY

0820 Housekeeping; summary of day's programme

0830 **Semi-Structured Interviewing** - continuation
Overview of previous day's do's and don'ts

0845 SSI guidelines: Protocol, closing the group, taking notes, open and closed questions, judging responses, ambiguous questions etc. Fact, Opinion, Rumour exercise conducted - 2 paragraphs were read and participants asked to raise hands (fact), cross arms (opinion) or put arms by their side (rumour). Growing awareness created.

0910 **But Why? Game**
Participants divided into groups of three, one as interviewer, one informant, and one recorder. Half were given the question "why is your goat so thin?", and the other half "why is your sorghum crop yellow?". I asked them to imagine peeling away the layers of an onion whilst probing with "but why?", "anything else?" and "tell me more about that". After 10 minutes of interviewing, each group reported back. Led to discussion on probing, leading questions, listening not lecturing and recording interviews. The sorghum question was not so successful as most participants had detailed technical answers. Better to choose a topic that participants have little knowledge of.

1010 **Presentation on PRA and Development: case studies from Bihar** - Ravi Jayakaran

1130 **Vegetable soup energiser**
The group moved next door for an energiser. Today everyone was much more enthusiastic and immediately associated the move with pleasure. The groups then returned to sit together for the next exercise.

1140 **Venn Diagramming**
Brief introduction and showing of 5 slides. Instructions were for each group to imagine a village, list the institutions, cut circles of paper of different sizes, and placed as appropriate. Some used the floor, others the tables.

1230 Exhibition of diagrams. Rather than get each group to present their findings, all were asked everyone to circulate and look at the other diagrams. Each person was to write down one thing from each of the other diagrams that they thought was better than theirs', which they shared with the rest of their team in the buzz session. After 15 mins, the groups reformed to answer the two review questions:
What did you learn from this exercise?
What would you do differently next time?

1255 **Buzz Session**
Again groups were both defensive and proud of their own work. They thus had a tendency to say what was good about their work in comparison to others. But after reminding that the goal was to learn together, most focused on collective lessons learned.

1455 **Presentation on PRA Process and Sequences: case studies from Tamil Nadu** - John Devavaram of SPEECH

1545 **Line Game**
The line game was used to introduce concepts of sorting and differing criteria. There was great hilarity at the attempts to sort according to age. Four participants did their own sorting, before all returned in the vegetable groups.

1600 **Matrix Scoring Exercise**
Introduction to the method by describing and discussing two matrices in the training notes. The first task was for the groups to select topics - paddy varieties x 2, dryland fruits, trees, weed control measures. Second task to generate the criteria. Then 6 slides shown to make further points about the process. All groups then proceeded outside to do matrix scorings on the ground.

1720 Beginning of the exhibition. Again each group keen to be the best. Main learning point coming out of presentation was need to ensure all criteria are positive or negative, not mixed.

1800 **Buzz Session**
Once again the two reflection questions were used to reinforce the lessons of the exercise. Report back after group discussions.

1815 End

1930 **Winrock Slide and Audio of PRA in Nepal and India**

2030 End

DAY 3: WEDNESDAY

0810 **PRA Methods** - conclusion
Began with a summary of what we've achieved so far. Went through training notes drawing attention to range of methods not covered at all (eg, farm profiles, historical transects), or giving variations of others (eg, social mapping, wealth ranking, flow diagrams, local taxonomies and classifications, inventory of local innovations and practices). This included a brief session on intriguing practices. First the example of the sticks and papaya was given, which Ravi J. confirmed also happens in Bihar, there with a stick into the roots. This immediately generated ten or so new practices (mustard and cabbage grown together to capture aphids on mustard; kerosene on doors to prevent termite attack; sorghum/castor, pearl millet/groundnut and groundnut/castor to control pests; urea on manure to produce more biogas; hole puncture in leaf axil of maize to encourage extra cob production).

0900 Resumption after breakfast
Participants were asked to list the methods at the back of their notebooks. On another page I asked them to write the tips for interviewing - 6 helpers, FOR, "suppose", and key probes "but why" etc.

0945 **Picture Puzzle**
Used for the formation of the 3 field groups. Used Lion, Elephant and Rhino, as indigenous to India.

1000 **SSI Guide and Checklist Generation**
Secondary data handed out for each village. Groups asked to analyse secondary data and

produce flow diagrams/pie diagrams as a means of understanding some of the key components of the village and farming systems. Write up of checklists at 1100.

1110 **Problem-Solving Exercise**
Each group discussed the 6-7 questions. Presentation of answers at 1130. Each group then formulated a team contract, which were also presented back to plenary. Selections from contracts include:

o we agree to attend to PRA work, and not leave the programme incomplete.
o we will follow triangulation
o we will not interrupt farmers
o we will select a leader
o we will record all proceedings
o even if it is late in the day we will stay
o we will be conscious of everything farmers say
o we agree to arrive for work on time
o all of us will listen not lecture
o we will stick to the rules of the group
o we agree to be flexible

1205 Logistics and final field planning

1315 Depart for the 3 villages

All three groups met during the evening. One group went on discussing their findings until 2345. Already they were planning how to use these methods in their own research. One group decided to stay overnight on the second day so as to be able to spend more time with the farmers.

DAY 4: THURSDAY

Field Work

Two teams arrived back at the research station by about 1830, They reviewed the major issues of the day, and broke for dinner at 1950. One team member said "it was not like real work", even though this was at the end of a long day in the field. One group stayed in village overnight.

DAY 5: FRIDAY

Field Work

Visit to two villages by Vice-Chancellor of TNAU, Dr S Jayaraj.

1745-1940: brief presentations of some of the findings of the groups to the Vice-Chancellor. Some comments included:

"The stay helped us understand the village"

"The villagers drew everything - people are so sensitive for locating each and every place"

"This indicates that our classification according to statistics is not relevant" (with respect to wealth

ranking)

"We have been exposed to a new methodology"

"This is the first workshop where we have learnt so much"

1940 Lecture by VC (Dr S Jayaraj)

DAY 6: SATURDAY

0845 Day begun with review of workshop thus far, and planning for next four days, including a clear restatement of the workshop objectives.

For the write up, participants were asked for two types, namely the process involved in the production of each diagram, and the major issues arising. The next phase of the fieldwork would be more focused on the problems and constraints arising out of the analyses.

0920 All groups began writing. Responsibilities and tasks were allocated.

1600 Elephant group departs for final session of fieldwork. Other two groups continue to work on writing up process and methods.

1830 Long discussion ensues about what happens when researchers get back to their own institutions. Most felt they would lack the support to continue to use PRA in their normal research. Constraints and how to overcome them were discussed. Individuals continue on writing late into the evening. Field team returns at 2030.

Two resource persons leave workshop today - Nancy Axinn and Vijay Kumar.

DAY 7: SUNDAY

0845 One group stays at station to write up its previous day's findings. Two other groups returned to the field for their final analyses. These were aimed at more focused analysis of problems and farmers' responses.

1400 Half day off

DAY 8: MONDAY

0845 Briefing. Last two resource people depart (John Devavaram & R Bhat) as remaining tasks are writing up, presentations and consideration of how to use PRA in research work.

0900 **Write up and Problem Analysis**
Groups spend two hours completing reports and writing out 2-3 sample problems in full (how did you learn about the problem; what is it; who is affected; how long has it been a problem; what are farmers' responses to the problem; key questions and hypotheses for research).

1100 **Presentations of 3 Village Reports**
Brief presentations by each group. Used this as a formal end to fieldwork component of the workshop. The objective was to share different methods, presentation of data and illuminate

different problems arising. Each group was asked before the presentations to develop a team contract for the presentations, particularly finding the means to let the talker know their time is up. Maximum of 25 minutes presentations, and 15 for questions.

1130 Three presentations, with a good mix of content and process: eg "we stopped by a group of women to ask for water, noticed the children were eating mochai, which led to a discussion about the different varieties of the crop grown by women, which led to a matrix scoring of 3 varieties". Groups used table tapping to keep everything moving, even clapping on a couple of occasions. All three groups finished more or less on time. Animated questions and discussions between each session. All participants had the opportunity to give part of the presentation.

1430 Collation of all three reports for photocopying. Each participant to go home tomorrow with a copy of their village report containing write up and diagrams.

1500 Presentation and discussion (K C John). Led participants through resource book (papers by Rhoades, Conway, Collinson, Tripp, Lightfoot, etc). Objective to situate the PRA methods covered in this workshop in a wider research and extension context. More on complementary methods, concepts, problem ranking, design, implementation problems for FPR/FSR, linking on-farm and on-station research, incentives for professionals.

1630 **3 Month Action Plans**
Participants were asked to form groups according to the institutions where they worked, and then begin the production of 3 Month Action Plans. All participants are expected to complete their own PRAs by the April review meeting. Groups were asked to consider:

- Objectives (eg training colleagues, running PRAs)
- Plan (What do you intend to do? Who will you involve? Where? When?)
- Constraints
- Possible solutions to constraints

1730 Celebration tea for all participants

2000 Celebration meal

DAY 9: TUESDAY

0900 **Review of Action Plans**
Whilst participants focused on thinking carefully about constraints, chairs were set up next door for constraints-solutions wheel exercise. Two sets of 5 chairs facing each other in two wheels.

0940 **Wheel Exercise**
Participants were split into 4 groups, taking care to make sure that those from the same institution would not meet each other as solution givers. Moved next door and explained rules of exercise. Gave three minutes for each consultancy, before the outside wheels rotates by one. People sitting on inside give their problems, those on outside give solutions. After one round of 5, switched two outside groups and moved inside to outside, so everyone had chance to give problems and receive solutions. Highly animated discussion throughout all 10 rounds of exercise.

1020 Return to reseach station groups to complete overhead transparencies with full list of

constraints and solutions.

1050 **Presentations**

Each of 9 groups presented their plans. Constraints fell into 7 main areas:

1. Financial allocations and responsibilities
2. Training materials
3. Transport and fuel
4. Approval, permission and support from superiors
5. Existing workload and leave arrangements
6. Linkages with Dept of Agriculture
7. Team selection and forming

1210 **Evaluation**

Participants in 5-6 groups considered:

o what did you find most useful in this workshop?
o what did you find least useful?
o what would you change for the next (Paiyur) workshop?

Report back after 20 minutes discussion.

Most Useful:

o understood village problems
o perceptions of scientists changed in this workshop
o we felt very happy to work in this workshop, even though it was tiring
o fruit salad and vegetable soup very good
o improved our capacity to understand villagers' problems
o we experienced good team spirit
o learnt how to break the ice
o last night's special dinner
o the way of conducting the workshop was helpful in keeping participants very active throughout the programme
o there has been a reversal of attitudes
o learned how to contact and interact with farmers
o learned how to involve farmers in the analysis
o we were able to identify micro-level problems
o learned how to organise a PRA without diversions and with good time management
o farmers able to express freely their problems
o transect walk very useful to meet farmers in their fields
o this workshop developed a team spirit amongst the scientists
o multidisciplinary teams helped the sharing of knowledge
o learned a new approach of farmers as scientists
o learned how to develop team spirit
o learned how to refresh our brains when under strain

Least Useful

o Failed to break deep rooted attitudes
o Some information collected not relevant to our work, eg venn diagrams, ethnic groups, health
o 3 groups said nil (probably culturally unacceptable to express this in public)

Changes

- o Participants should be less than 40 years of age - those older find it hard to change
- o More case studies
- o Stay in the village
- o Involve voluntary organisations and State Dept officials
- o Groups need a set programme for each day in the field
- o Evening visits necessary
- o Involve social scientists
- o More success stories
- o PRA members of a similar age group

1250 **Closing Ceremony**

APPENDIX *B:* LIST OF PARTICIPANTS AND RESOURCE PEOPLE AT ARUPPUKOTTAI WORKSHOP

S Subramanian
Associate Prof (Agrl Extn)
Tamil Nadu Agrl University
Regional Research Station
Kovilangulam 626 107
Kamarajar District
India

C Jayanthi
Assistant Prof (Agronomy)
Regional Research Station
Paiyur 635 112
Kaveripattinam
Dharmapuri Dist
Tamil Nadu

N Kempuchetty
Associate Prof
Dept of Agronomy
Tamil Nadu Agrl University
Coimbatore 641 003

D Ananthakrishnan
Associate Prof (Farm Machinery)
Regional Research Station
Paiyur 635 112
Kaveripattinam (via)
Dharmapuri

K Renganayaki
Assistant Prof (Bio-Tech)
Centre for Plant Molecular Biology
Tamil Nadu Agrl University
Coimbatore 641 003

S Muralikrishnasamy
Assistant Prof (Agronomy)
Tamil Nadu Rice Research Inst
Aduthurai 612 101
Tanjore Dist

M Chandrasekaran
Assistant Professor
Forest College and Res Inst
Mettupalayam 641 301
Coimbatore Dist
Tamil Nadu

B Subbalakshmi
Associate Prof (Ag. Bot)
PAJANCOA
Karaikal 6
Tamil Nadu

P Parameswaran
Associate Prof (Agronomy)
Agrl College & Research Inst
Madurai, Tamil Nadu

S Kuttalam
Assistant Prof (Agrl Entomology)
Regional Research Station
Paiyur,
Kaveripattinam(via) 635 112
Dharmapuri District

R Shantha
Agronomist
National Pulses Research Centre
VAMBAN
Pudukottai 622 303

T N Balasubramanian
Associate Professor in Agronomy
IDRC Project on Sesame on-Farm Research
Krishi Vigyan Kendra
Vridhachalam 606 001

M Manoharan
Associate Professor (Agrl Extension)
Agrl College & Research Inst
Killikulam
Vallanadu 627 252
Tamil Nadu

P Sauthri
Professor (Soil Science & Agrl Chemistry)
Forest College and Research Institute
Mettupalayam 641 301
Coimbatore Dist

R Vijayaraghavan
Deputy Director (Information)
Tamil Nadu Agrl University
Coimbatore 641 003

S Geetha
Assistant Professor (Ag Bot)
Tamil Nadu Rice Res Inst
Aduthurai 612 101
Tanjore Dist

PARTICIPATORY RURAL APPRAISAL FOR AGRICULTURAL RESEARCH, AT PAIYUR, TAMIL NADU

Edited by
A Paliniswamy, S R Subramanian, Jules N Pretty & K C John

With contributions by members of three field teams:

Jagathap Village
J Krishnarajan
B Chandrasekaran
S Devarajan
V Ravichandran
G Doraiswamy
S V Geethalakshmi
K S Devarajan
Bernard J P
Jules N Pretty

Karagur Village
K Natarajamoorthy
C Chinnuswamy
P Nasuredeen
N Shanmugavalli
R Ganesan
V A Sakunthala
Janardhana Rao
K C John

Kumbarahalli Village
A Paliniswamy
M Shanmugam
A Palchamy
S Jeeva
Amala Das Devakirubai
V Natarajan
B Thiagarajan
A Kumar
Bernard J P
K C John

Department of Agricultural Economics,
Centre for Agricultural and Rural Development Studies
Tamil Nadu Agricultural University, Coimbatore

COMMUNITY HEALTH CELL
LIBRARY AND DOCUMENTATION UNIT
BANGALORE.
03076
ACE100

International Institute for Environment and Development, London

1992

3. PRA OF JAGATHAP VILLAGE IN DHARMAPURI DISTRICT

J Krishnarajan
B Chandrasekaran
S Devarajan
V Ravichandran
G Doraiswamy
S V Geethalakshmi
K S Devarajan
Bernard J P
Jules N Pretty

1. Introduction to the PRA

The following objectives were set forth in order to take up the PRA analysis of Jagathap village:

- To employ various PRA methods in understanding the villagers' participation and association with their own agroecosystem in terms of different resource zones; formal and informal institutions; and the long and short term problems in resource zones and specific problems in cropping and farming system;
- To identify the advantages and limitations of the practised PRA methods.

The systems interactions with respect to space, time, flows and decisions were analyzed by using a combination of PRA methods in agroecosystem analysis framework. The various PRA methods used were:

- Semi structured interviewing
- Farm profiles
- Social mapping
- Resource mapping
- Individual profile
- Transect walks
- Resource flows
- Time line
- Nutrient flows
- Historical profile
- Seasonal calendars of income, expenditure, crops, livestock, rainfall, credit, etc.
- Venn diagram
- Matrix scoring
- Crop biographies
- Triangulation

Before employing the PRA methods in the village, the PRA team had a brain storming session on the checklist of parameters to be identified. This was carried out at inter group

and intra group level. After a thorough discussion the revised checklist was prepared.

The team members also developed a contract in order to make the members clear about the individual responsibilities and to know how to deal with difficulties and contingencies in the field. The team divided into three sub groups. On every day, the report was prepared in the evening and presented to the group in the next day morning.

2. Overview of Jagathap Village

Jagathap is one of the villages of Karimangalam Panchayat Union of Dharmapuri District. The name Jagathap for the village was derived from the term Janaparhalli meaning families involved in fibre trade. It is located 4 km away from the Regional Research Station, Paiyur, which is attached to Tamil Nadu Agricultural University. It is well connected by roads.

The population of the village is 6064 (men-2316,women-2113 and children-1416). Among the total population, 45 percent o ned lands and the rest of were landless agricultural labourers. The population of scheduled castes and scheduled tribes was 167. The castewise distribution of families is as follows:

Vanniarsh -	247
Harijansh -	38
Blacksmith -	5
Barber -	5
Dobi -	3
Vellala gounders -	2
Total -	300

The total geographical area is 1101 ha of which 881 ha (80%) is under cultivation. Cultivable waste occupied an area of 126 ha (11.5%). Poramboke lands occupied 92 ha (8.4%) and grazing lands formed 2 ha. Of the total area, wet land is 132 ha (15%) and the remaining 749 ha is under dryland cultivation. No land area is reported under forest cover. The soils are predominantly red loamy soils prevail in the village with isolated patches of saline and alkaline soils. Silt and sand tractions are dominant in the composition of soils. The permeability rate is fairly high and the fertility of soils is aver age. A sub soil hard pan is also present in certain pockets.

The mean average annual rainfall is 845 mm, of which 38 percent is received during north east monsoon. Rainfall during south west monsoon is 44 percent and the balance is received during summer months (18%). Dry lands occupy 85% of total cultivated area. Only 15% of the area under cultivation has got supplemental irrigation from wells.

Farmers used to grow a great range of varieties of crops. These included the rice varieties *kona samba, sevelu samba, Chinna samba, Periya samba, Vellai kar, Kichadi samba, Kurivi samba* etc. Similarly in finger millet, varieties like *Upparium, Valappuarium, Vella suruthai arium, Kolikondai arium, Karuppusarutai arium* were grown. In sorghum, *Sencholam, Muthucholam* and *Kakacholam* and in pearl millet, *Kullankumbu* were grown since ancient time. Under horticultural crops, in banana *nathu nambai, monthan*, and *Siruvalai* and in mango, *Nathumaram, fall, pacharisi maram, Pulipumah*, yellow variety were the predominant varieties in the village.

With reference to livestock wealth of the village, the goat population used to be high. There are now 811 milch animals and 42 work bullocks in the village. Sheep (2114) out number goats (1818) which act as a source of income for dry land farmers.
Naturally grown lab lab and shrubs such as *Avaran, Pollavarai, Kavazhi, Calotropis* and excreta of birds were used as organic manure in the fields.

In ancient time people in the village used a wooden structure called *kuthukallu* for lifting water from open well. Due to its less durability the farmers designed an alternate lifting device called *Alangankally* or *Alagaum* made of stone.

Tomato, cotton, cowpea and bunch groundnut have only been grown during the past fifteen years. The medium duration rice varieties with 135 days growth period is even kept in the field up to 189 days under drought situation expecting rains. Though the latest sugarcane varieties are introduced the loss in cane weight and germination from the nodes were the major problems experienced by the farmers. Due to low cropping intensity farmers in the village are getting very low income from their farm activities and year after year their standard of living is going down.

The following rainfed cropping patterns are followed:

Cholam + Redgram
Groundnut + Redgram
Groundnut + Lab Lab
Groundnut + Castor
Groundnut + Cowpea
Cotton + Cowpea (border crop).
Rainfed Tomato

The systems followed in the wetlands are:

Rice - Tomato (one year rotation)
Rice - Finger millet or pearl millet (one year rotation)
Sugarcane - Sugarcane Ratoon (two years rotation)

There are several public institutions in the village, including a primary school, a milk producers' co-operative society and a ration shop. The village is connected with N.H.7 road by Tar road. Town buses are plying to this village. There is also a temple and a church.

This being a drought-prone rainfed tract, variations in the rainfall affect the employment opportunities of the farmers in the village. Agricultural labourers get employment for 100-150 days in a year. During April, May, June and July there is limited scope for employment agricultural labourers. During drought years large scale migration of labourers occur to nearby cities for construction work. During off-season the labourers are engaged in road construction work. There is no industry worth mentioning in the village or in the neighbourhood for providing employment.

No financial institution is operating in this village. However, the primary agricultural co-operative bank and branches of Nationalised Commercial Banks at Kaveripattinam and Krishnagiri located at a distance of 7 km and 22 km respectively are catering to the needs of the farmers. Nevertheless, the farmers find it difficult to get loans.

Data on land use pattern, irrigation sources and area under different crops are furnished below:

A) Land use pattern:	Area in ha.
■ Geographical area	1101.0
■ Forest	-
■ Barren and uncultivable	64.5
■ Land put to non agricultural use	128.0
■ Cultivable waste	40.5
■ Permanent pastures and other grazing land	-
■ Land under misc tree crops and groves	6
■ Current fallow	631.0
■ Other fallow lands	-
■ Net area sown	231.0
■ Total cropped area	304.5
■ Area sown more than once	98.65

B) Source of irrigation	Area in ha
■ Canals	32.00
■ Tanks	4.00
■ Wells	120.00
■ Other sources	30.50
■ Number of total wells	327 Numbers
■ Number of wells used for irrigation	304 Numbers

C) Cropping pattern:	Area in ha
■ Paddy	74.00
■ Ragi	13.00
■ Cumbu	20.00
■ Samai	60.00
■ Cholam	40.00
■ Pulses	400.00
■ Cotton	10.00
■ Groundnut	300.00
■ Tomato	15.00

3. Participatory Mapping of the Village

The PRA team arrived in the village at 0945 on the first morning. A small group of farmers were waiting, and they walked with the team up to the school in the centre of the village. The mapping started at 0955 with the team members collecting a couple of sticks and asking farmers to illustrate the detail of the village on the ground. Everything started very easily as one of the farmers had been with the team for the previous two days training in the workshop at Paiyur RRS.

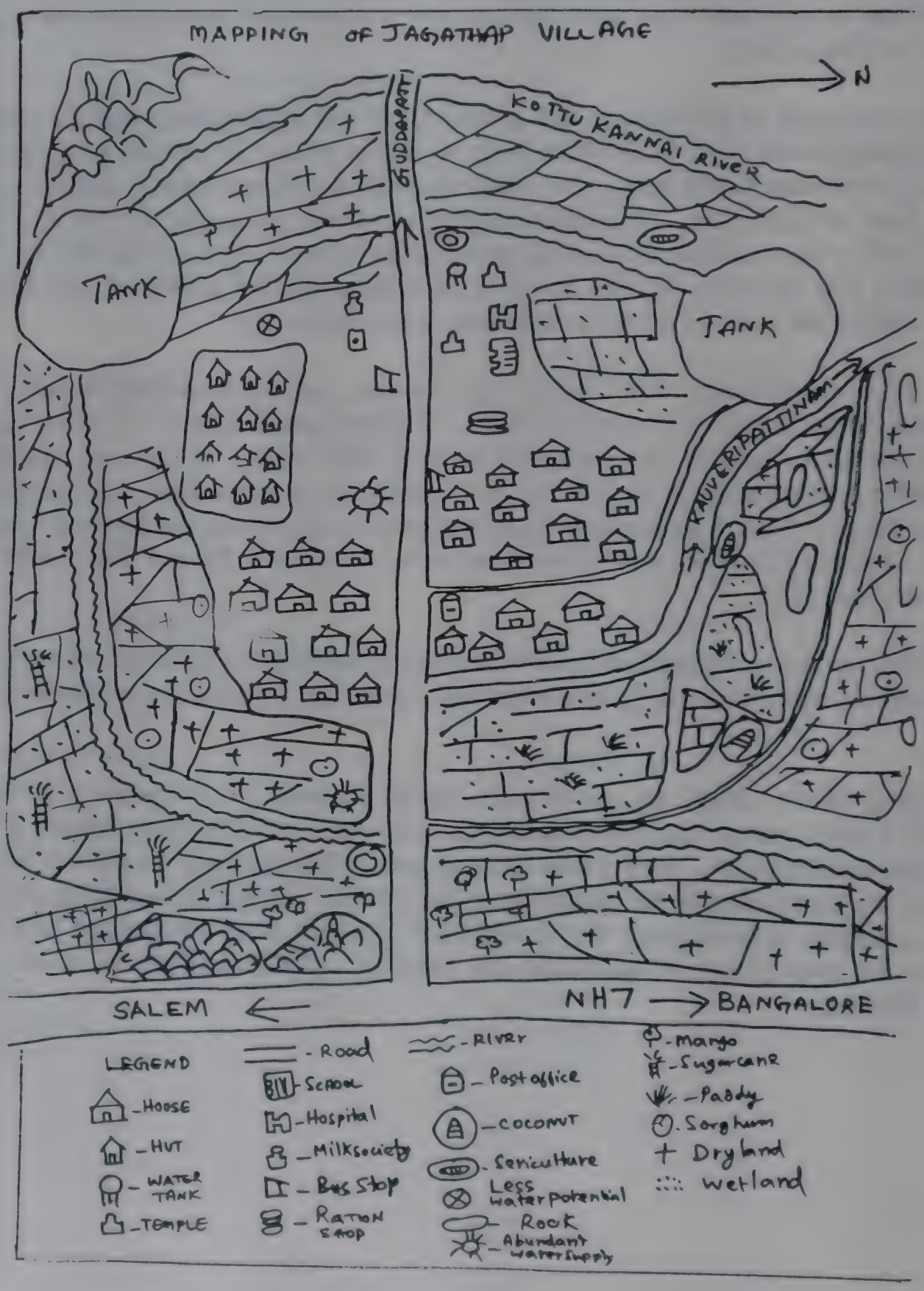
By 1020, the group of participants had grown to 18 men, 20 women and 30 children. Rangoli powders were used to show the roads in white, houses in yellow, water tower in white, the schools and health centre, the village boundaries and two tanks in purple, and the irrigated land with grey ash. The main mapping work was conducted by 2-3 men and 2 women, whilst others commented and suggested modifications. One problem the team had was ensuring that the AO, who was trying to be helpful, did not provide all the answers. When he spoke, the farmers tended to stop talking and listen only.

By 1045 there was sufficient detail to interview the map, and the PRA team began a series of interviews about a range of interesting issues. Different people became involved, and new ones held the stick. In this way sequential changes were made. In one case, an elderly woman came forward to point out that the coop society had been omitted. The gaps on the map were steadily filled with details of cropping patterns, soil types, groundwater potential (this was illustrated with 2 symbols to show water at a depth 55 and 300 - 400 feet), housing, dryland fields.

By 1130 the map was completed, and two of the farmer participants drew the map on a large sheet of paper. Meanwhile many small interviews were being conducted on the periphery.

The mapping of the village by the farmers helped the team to understand the existing facilities in a better manner and has created awakening/awareness among the farmers to think about future developments. In this way the map was useful in giving the present status of village for any future plan for the prosperity of the village. During the rest of the PRA, the resource potential, infrastructural and institutional facilities were triangulated with other farmers in far away places of the village and found to coincide with details given in this mapping exercise.

FIGURE 1


MAPPING OF JAGATHAP VILLAGE
N
KOTTU KANNAI RIVER
TANK
TANK
KAUVERIPATTINAM
SALEM
NH7 → BANGALORE
LEGEND
- Road
- River
- Mango
- House
School
Post office
- Sugarcane
- Hut
Hospital
Coconut
- Paddy
- Water tank
Milk society
Sericulture
Sorghum
Dryland
- Temple
Bus stop
Less water potential
Wetland
Ration shop
Rock
Abundant water supply

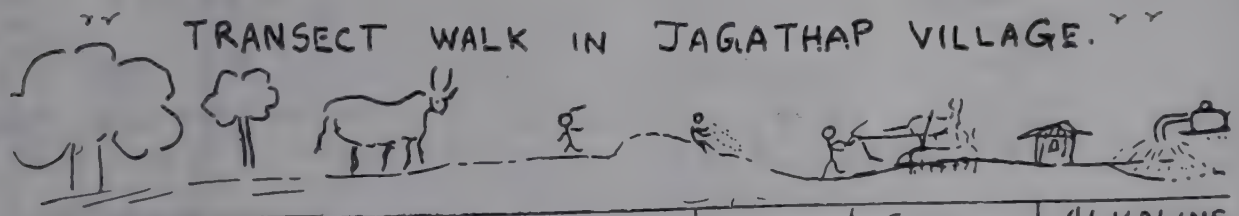
4. Transect Walks

The PRA team divided into 3 sub groups after the mapping, and set out on transect walks accompanied by groups of farmers. The routes for the walks were planned with the farmers using the map on the ground. On the way the team members interacted with the farmers and collected data on social, historical, cropping, farming and socio economic aspects of the village. A range of PRA methods were used during the transect walks, including matrix scorings, farm profiles, seasonal calendars etc.

It was clear that farmers were utilising a wide range of intercropping practices in the drylands, eg groundnut with pigeon pea and castor, groundnut with green gram. Details were given of local varieties of crops and several indigenous technologies were observed and discussed, such as protection of coconut trees against pilferage and tree dog (a squirrel) pests with thorns tied around the tree at 2 metres height, or polythene sheets covered in oil tied to the tree.

Based on the transect walk the team found that the village has six soil types and identified various micro agro-eco-system zones and the problems that existed in the village. This would facilitate in tackling future priorities. Based on these two methods, implications were drawn to highlight the administrators researchers, policy makers and extension personnel on the existing situation. The major problems in each of the zones are illustrated on the diagram.

FIGURE 2

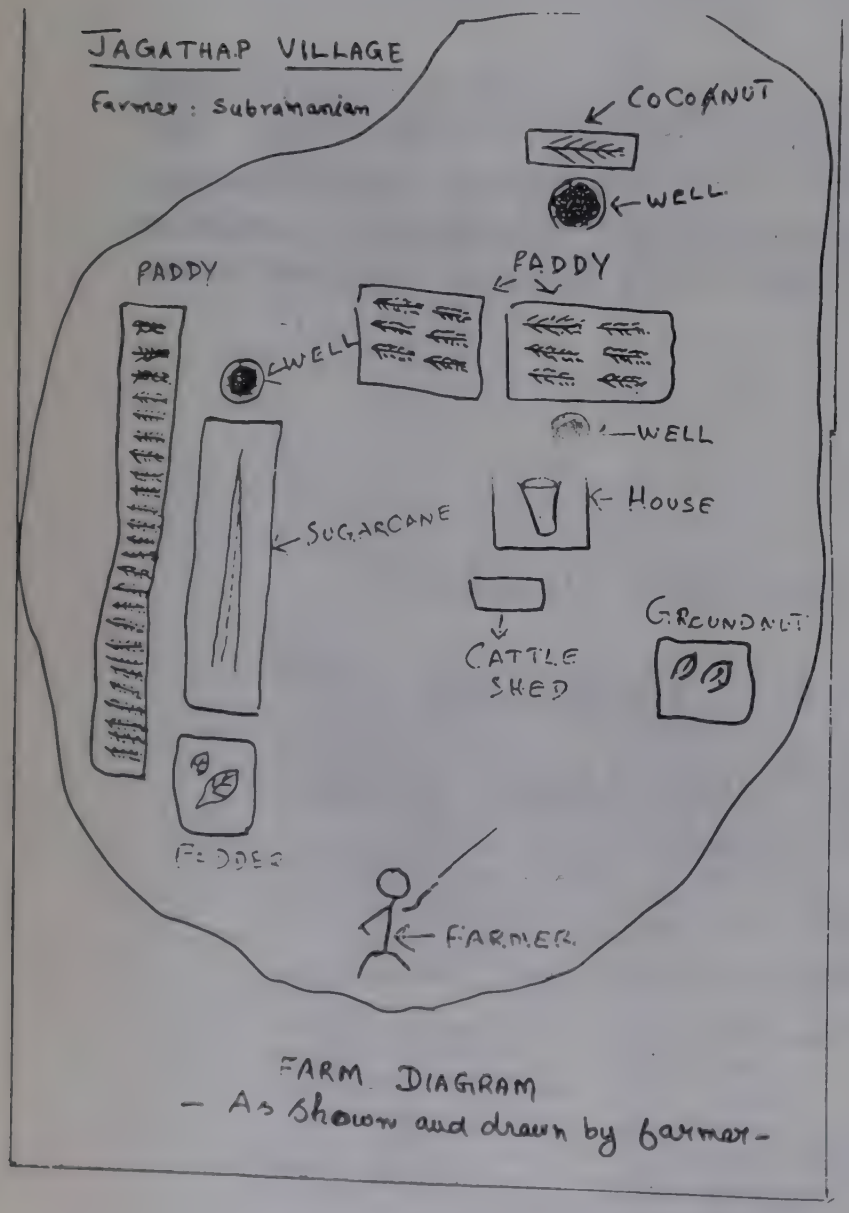


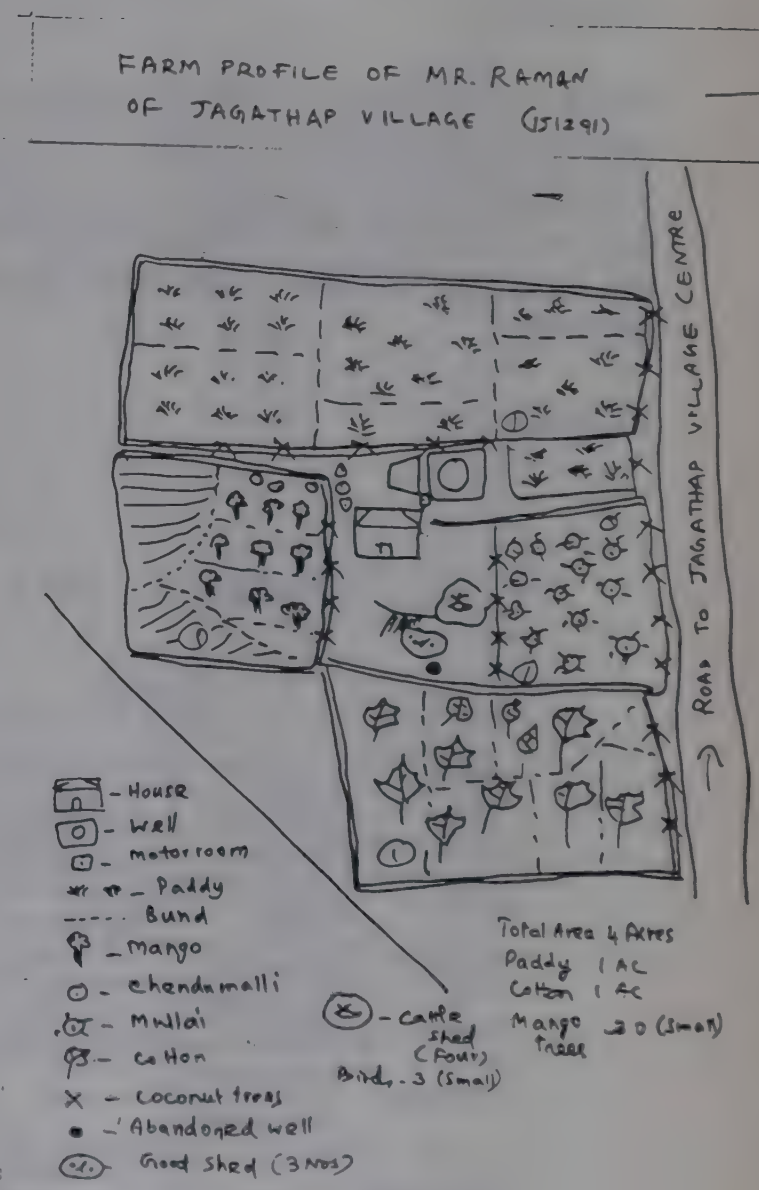
SOIL	RED (SEMMAN)	CLAY (KAZHI)	SANDY SANDY LOAM	CALCARE-OUS	GRAVEL (கற்கள்)	ALKALINE (களர்)
CROPS	REDGRAM CASTOR, MANGO DEW GRAM COWPEA	PADDY, JASMINE SUGARCANE FINGER MILLET BANANA VEGETABLES	SUGARCANE COCONUT PADDY VEGETABLES FINGER MILLET	HORSEGRAM COWPEA	CASTOR SORGHUM	PADDY BANANA FINGER MILLET
PESTS & DISEASES.	POD BORER MANGO HOPPER PREDONIA SEMI LOOPER	STEM BORER SHEATH ROT BUD BORER HELMINTHOSPORIUM BLAST.	EARLY SHOOT BORER RED PALM WEEVIL	POD BORER	SEMI LOOPER EAR HEAD BUG	BLAST NEMATODES
LIVESTOCK	LOCAL COWS JERSEY GOAT, SHEEP.	JERSEY HOLSTEIN	GOAT SHEEP.	GOAT SHEEP	LOCAL COWS	LOCAL COWS BUFFALOWS
SOIL CONSERVATION	—	WELLS FITTED WITH OIL ENGINE	OPEN WELLS WITH MOTOR	WELLS WITH MHOTE	WELLS	OPEN WELLS WITH MHOTE
WATER RESOURCES	GULLY PLUGGING WITH BOULDERS	CONTOUR BUNDS	FIELD BUNDS	FIELD BUNDS	STONE EMBARKMENT	—
WEED FLORA	ACALYPHA EUPHORBIA AMARANTHUS	CASSIA, CYPERUS TRIDAX, CYNODON BOERHEVIA.	ALTERNANTHERA PORTULACA ACHYRANTHUS	PARTHENIUM PORTULACA	ACHYRANTHUS ECLIPTA	ERESINE BOERHEVIA
RESEARCH PROBLEMS	SHORT DURATION VARIETIES-PULSES	NUTRITIONAL STUDIES-CB ANIMALS	SOIL CONS. MEASURES.	NUTRIENTS MANAGEMENT	WATER CONS. MEASURES	SOIL RECLAM. STUDIES.

5. Farm Profiles

On a transect walk, the team asked two farmers, one big (^T) and one small farmer (1.30 ac) to draw farm profiles of their own farms indicating various components and activities. This was done to know whether the farmers are aware of the resources available in different areas of the farm which in turn are to be interlinked for better use and adoption. They drew the components of the farm and then discussed the flows between the components. This led to an understanding of the interactions between crops and livestock (manures and fodder), water and crops (paddy and sugar cane), and crops and wild plants (such as the carrying of *Abutilon* and *Colotropis* to paddy fields, where it is trampled in as a green manure).

FIGURES 3, 4





6. Historical Time Line

In order to understand the time dimensional and population analysis, the following PRA methods were used:

- Historical time line
- Seasonal analysis
- Expenditure pattern of household
- Income and expenditure pattern of household
- Employment pattern of women labourers
- Farm mechanisation improvements over year
- Profile of individual
- Crop biographies (Time series)
- Diversification of crops and animals
- Cropping system

The historical time line pattern of Jagathap village showed a marked difference of turning points or shift in major components of agro-ecosystems and also cropping and farming system. One villager (Ramasamy) was able to bring out the important historical events. As variation was observed in this process, the contradictions were triangulated with other villagers. This method helped to bring out the rate of the growth of the village in terms of educational institution, animal breed and tree crops along with the standard of living of people. Since the farmer was relatively the eldest he could narrate the historical events.

FIGURE 5

HISTORICAL TIME LINE - JAGATHAP VILLAGE

1930 : Old paddy varieties like kora samba and Seruku samba were grown

1940 : Started cultivating Samai, Thinai, Ragi, Redgram green gram and Dheo gram and maintained large number of goats
Village was electrified.

1950 : Started cultivating bunch groundnut and Pearlmillet

1960 : Krishnagiri Reservoir Project (KRP) started operating
Old sugarcane variety CO 419 was cultivated
Water table in the village wells were 15' from ground level.

1970 : A co-op. sugar factory was started at Palacode
People started constructing tiled houses.

1972 : Primary school was started

1980 : Cross bread milch animals were introduced

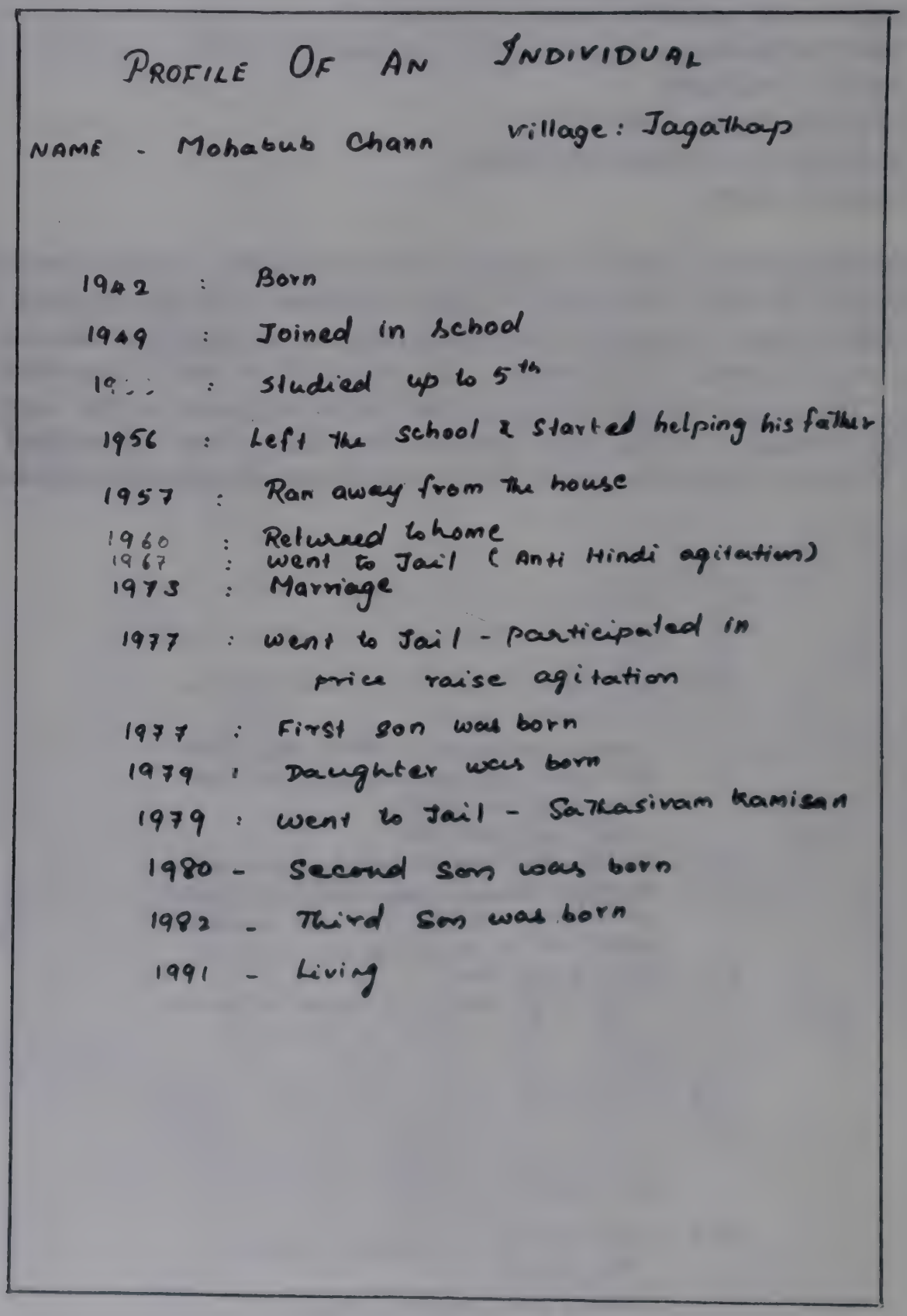
1985 : Casuarina and Eucalyptus trees were planted
Milk producers association was started
Rice became main food of the farmer

1989 : Road leading to Jagathap village was black topped
Drinking water tank was constructed.

7. Time Line of an Individual

Another interesting feature in a timeframe is the time pro file of an individual (Mohabab chann). Through semi-structured interview and repeated triangulation, the individual was able to bring out series of events in his life time.

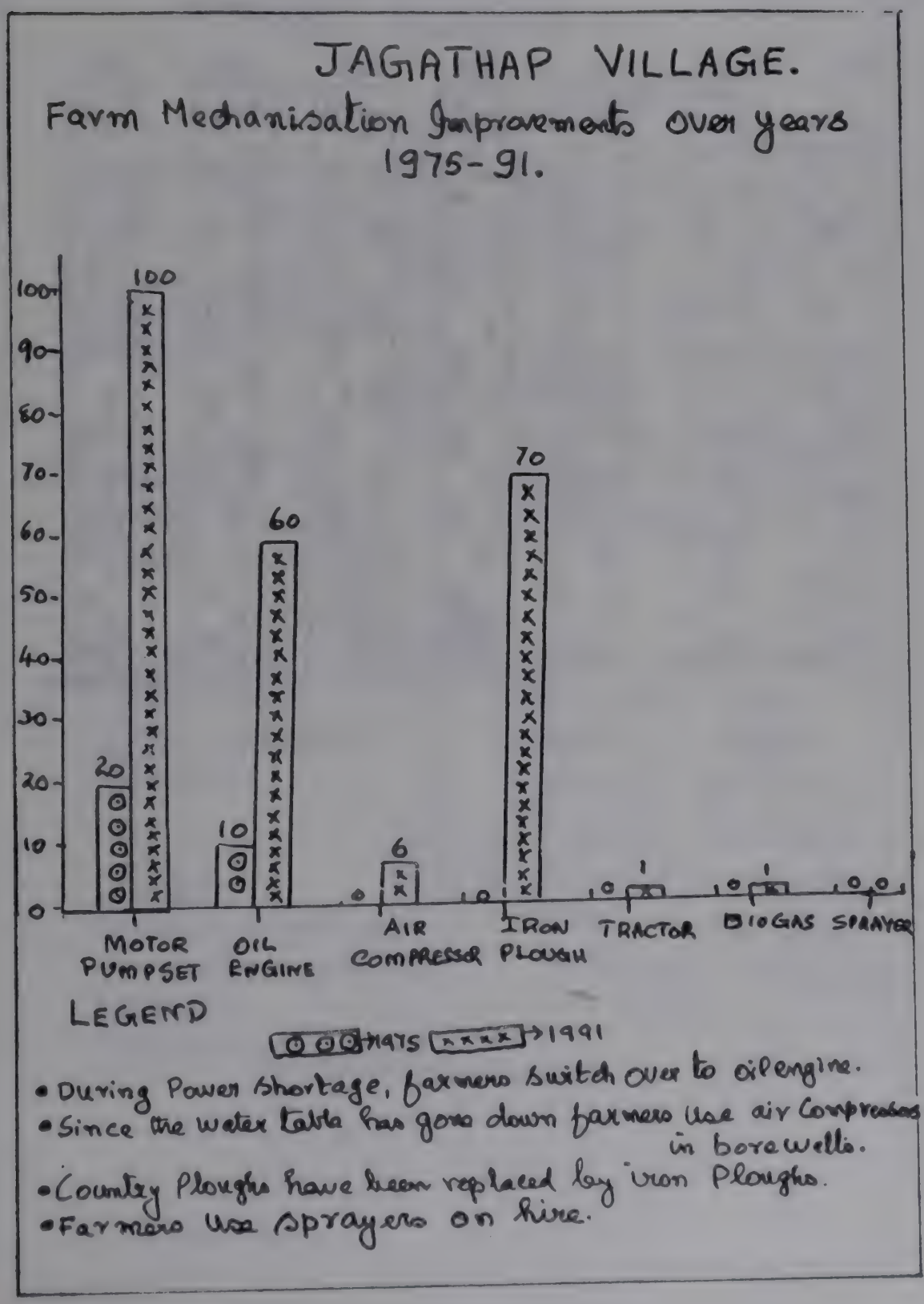
FIGURE 6


PROFILE OF AN INDIVIDUAL
NAME - Mohabub Chann
village: Jagathap
1942 : Born
1949 : Joined in School
19[illegible] : Studied up to 5th
1956 : Left the school & started helping his father
1957 : Ran away from the house
1960 : Returned to home
1967 : went to Jail (Anti Hindi agitation)
1973 : Marriage
1977 : went to Jail - participated in price raise agitation
1977 : First son was born
1979 : Daughter was born
1979 : went to Jail - Sathasivam Kamisan
1980 - Second Son was born
1982 - Third Son was born
1991 - Living

8. Farm Mechanisation Changes, 1975 - 1991

Another time frame analysis was carried out with reference to improvement of farm machines in Jagathap village during the period 1975-91. Through semi-structured interview the information was collected and plotted on a bar chart. Country ploughs have been replaced with iron ploughs, and farmers have shifted to using air compressors in response to falling groundwater. Oil engines are needed, particularly during power shortages.

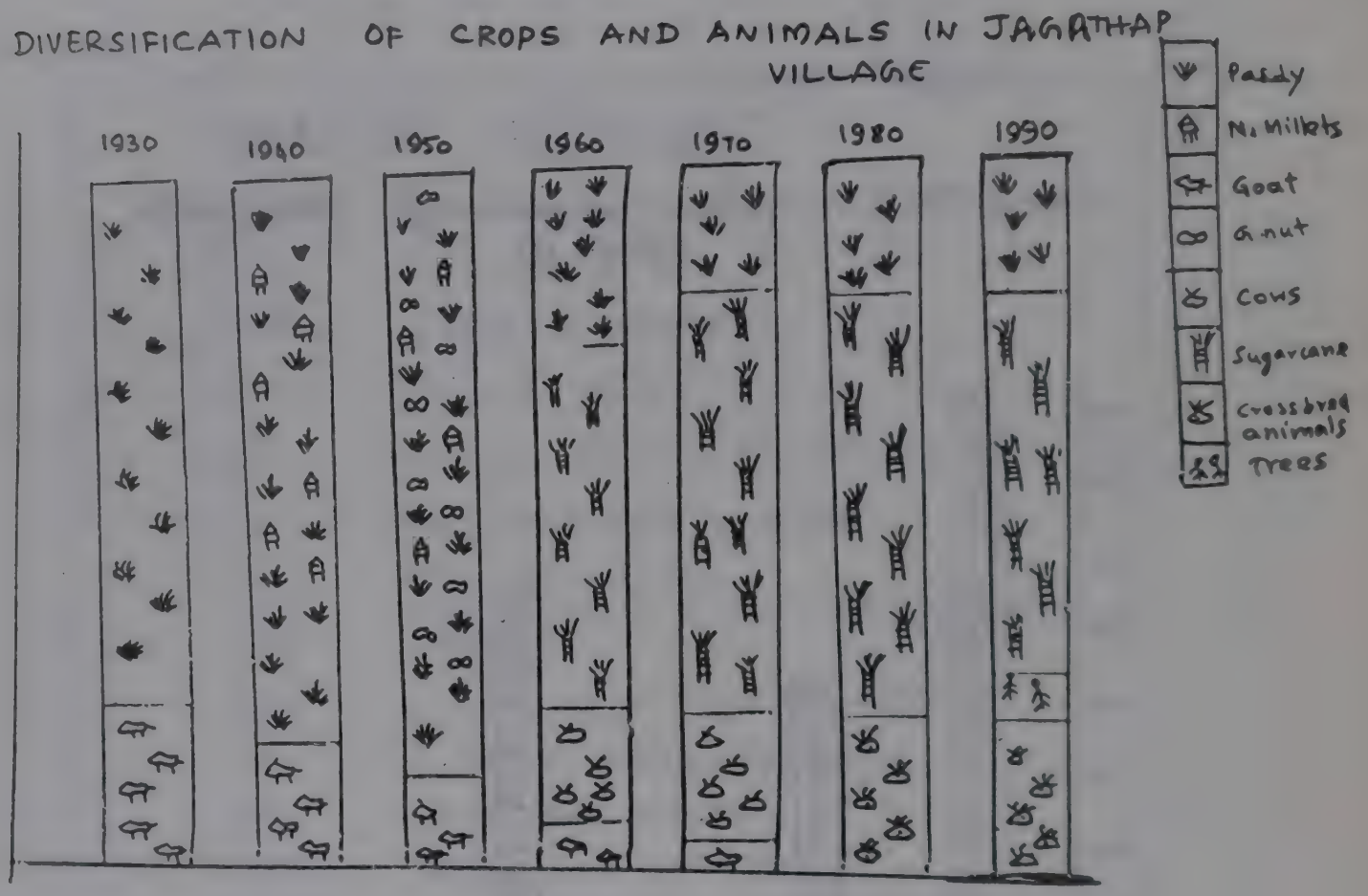
FIGURE 7



9. Crop Diversification

A seven year time based crop and animal diversification was attempted with the villagers. A combination of semi-structured interviewing and visualisation methods were used. The villagers placed appropriate materials on the ground to show the increase or decrease of crop area and animals in that village.

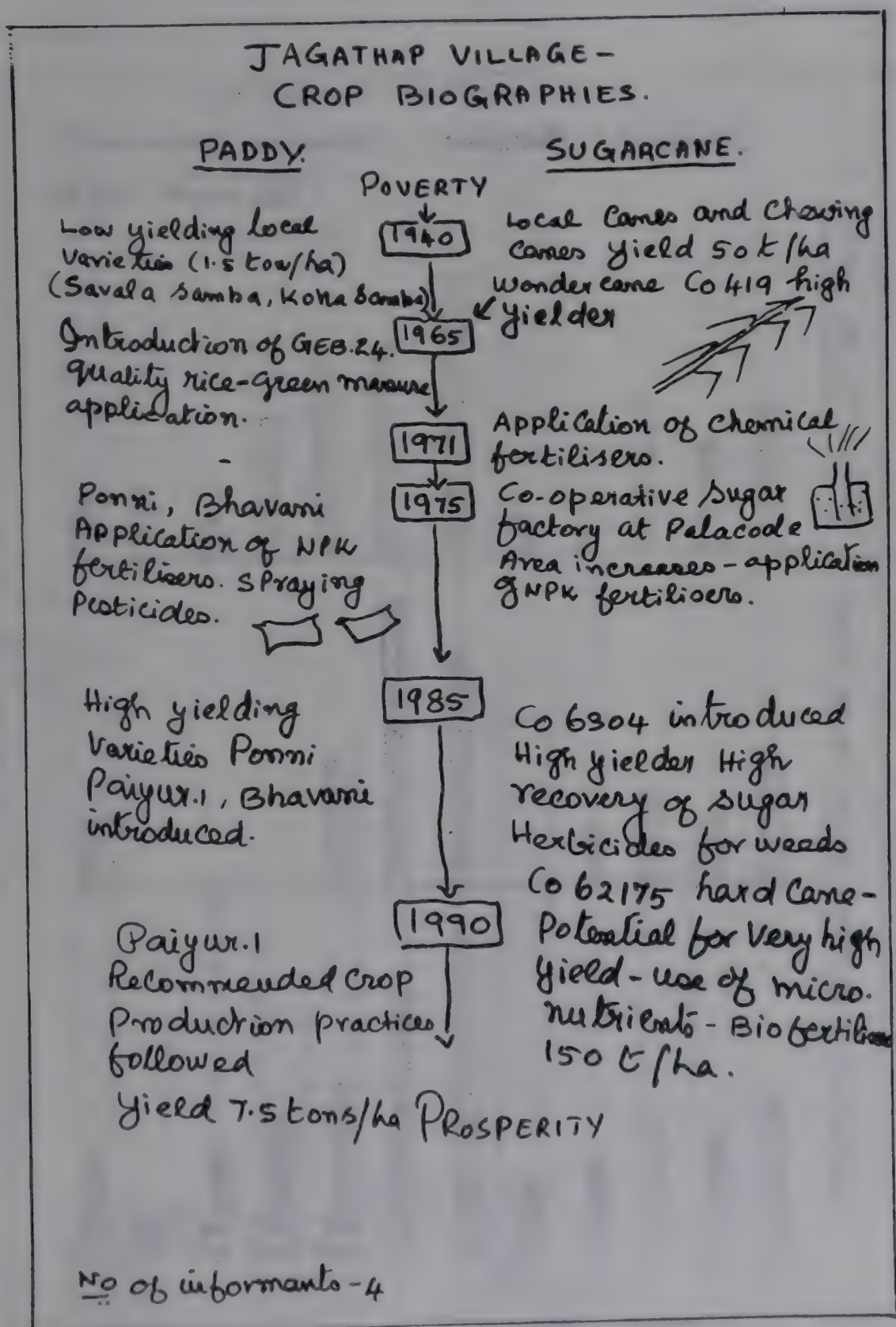
FIGURE 8



10. Crop Biographies of Paddy and Sugar Cane

A crop biography was also prepared with the help of a villager Mr.Raman. Through semi structured interview, the crop biography on paddy and sugarcane was prepared. Frequent triangulations were made to confirm the year of events and connections among them. This showed the changing use of varieties and the adaptations necessary at farm and village level to these changes.

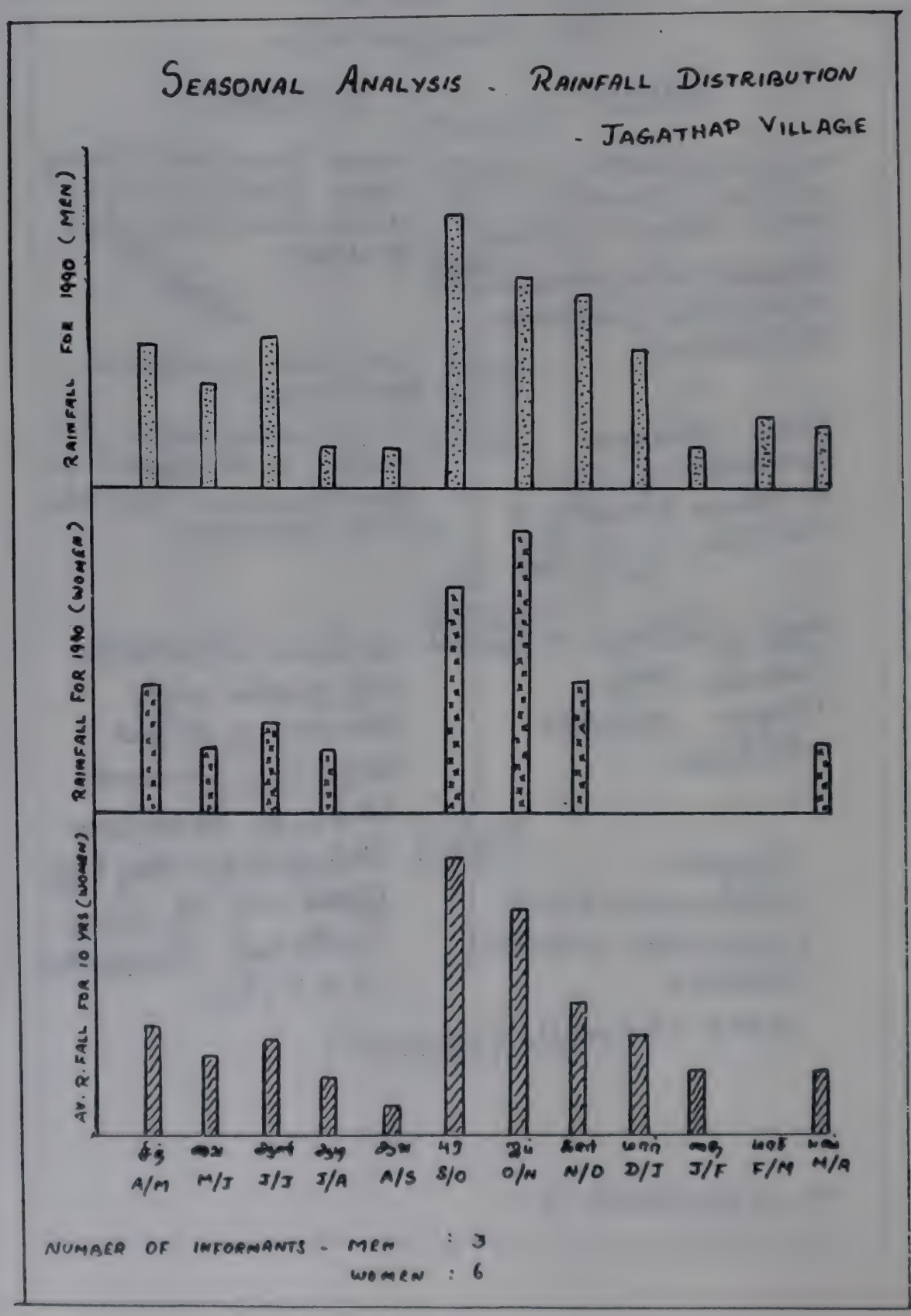
FIGURE 9


JAGATHAP VILLAGE-
CROP BIOGRAPHIES.
PADDY
SUGARCANE.
POVERTY
1940
Low yielding local varieties (1.5 tow/ha) (Savala Samba, Kona Samba)
Local canes and Chewing canes yield 50 t/ha
Wonder cane Co 419 high yielder
1965
Introduction of GEB.24. quality rice-Green manure application.
1971
Application of chemical fertilisers.
1975
Ponni, Bhavani Application of NPK fertilisers. Spraying Pesticides.
Co-operative Sugar factory at Palacode Area increases - application of NPK fertilisers.
1985
High yielding Varieties Ponni Paiyur.1, Bhavani introduced.
Co 6304 introduced High yielder High recovery of Sugar Herbicides for weeds
1990
Co 62175 hard Cane - Potential for very high yield - use of micro. nutrients - Bio fertilisers 150 t/ha.
Paiyur.1 Recommended Crop Production practices followed
Yield 7.5 tons/ha PROSPERITY
No of informants - 4

11. Seasonal Calendars: Rainfall

In respect of seasonal analysis of rainfall distribution for the last year (1990) two groups were used (Men and women). It was noticed that these two groups were able to indicate more or less the same extent of rainfall. But variation was observed in the sense that the women group was not able to recall the rainfall pattern for some months. It was confirmed with triangulation process also. The groups used sorghum straw and broom sticks for showing the rainfall pattern.

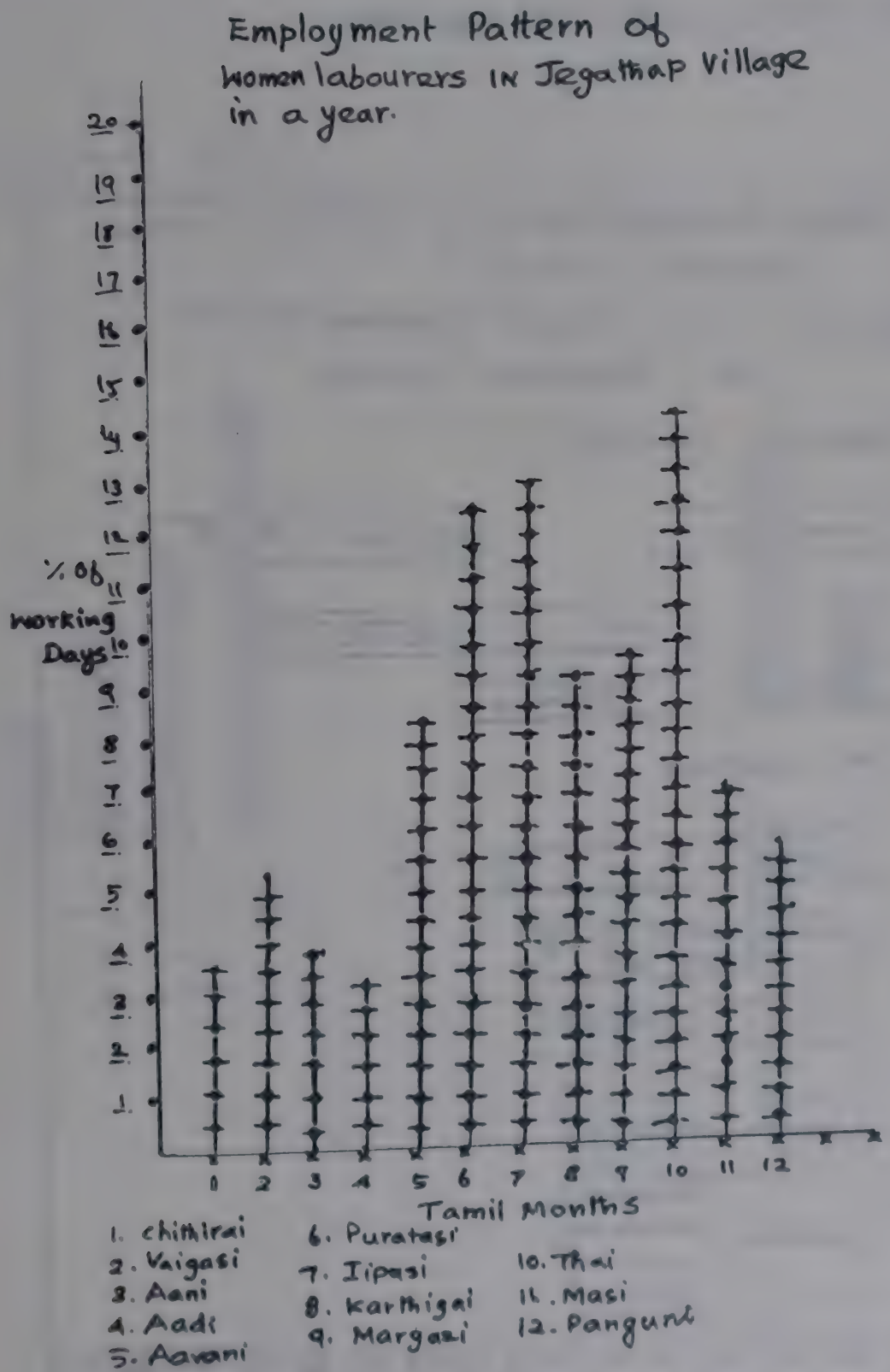
FIGURE 10



12. Seasonal Calendar: Employment Pattern

Another PRA method of time analysis was carried out in respect of the number of days of employment every month to women agriculture labourer. One woman agricultural labourer, namely Mangai, did this by putting small stones for different months in a year. While she was doing this, semistructured interviewing and triangulation were adopted for confirming the issues. She was given a chance to modify any of her responses at the end.

FIGURE 11

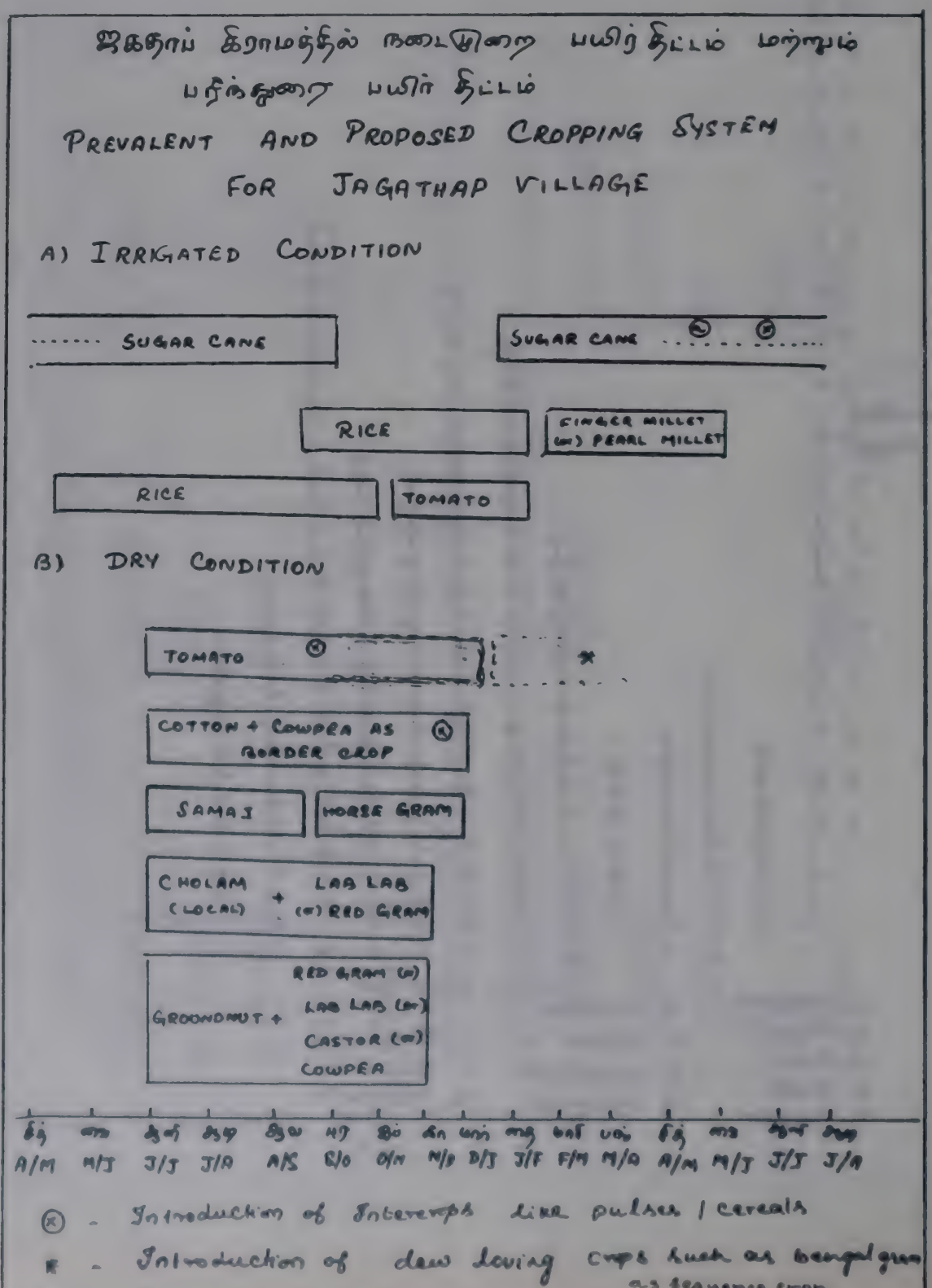


13. Seasonal Calendar: Cropping Patterns and Proposed Adaptations

Using the semi structured interview with the farmers the present cropping system for irrigated and rainfed lands were analysed. The opportunities identified by the PRA team with the farmers were:

- Introduction of intercrops in the irrigated lands;
- Introduction of dew loving crops, such as bengal grass, as a sequence crop after tomatoes;
- New rotation patterns, especially after sugar cane.

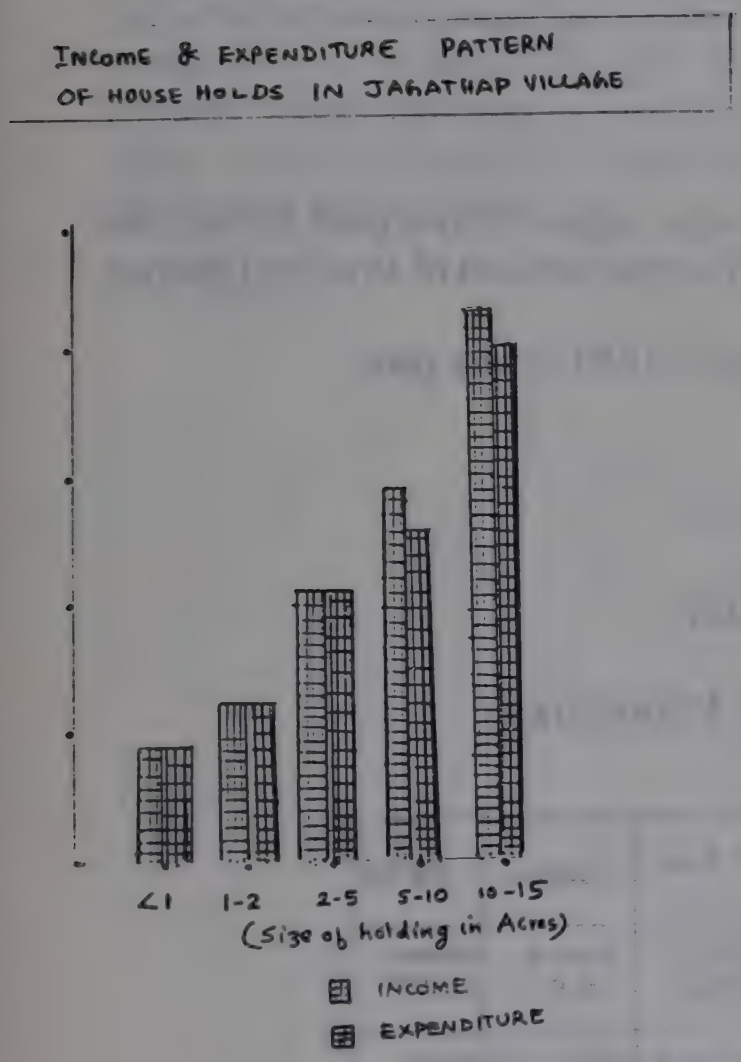
FIGURE 12

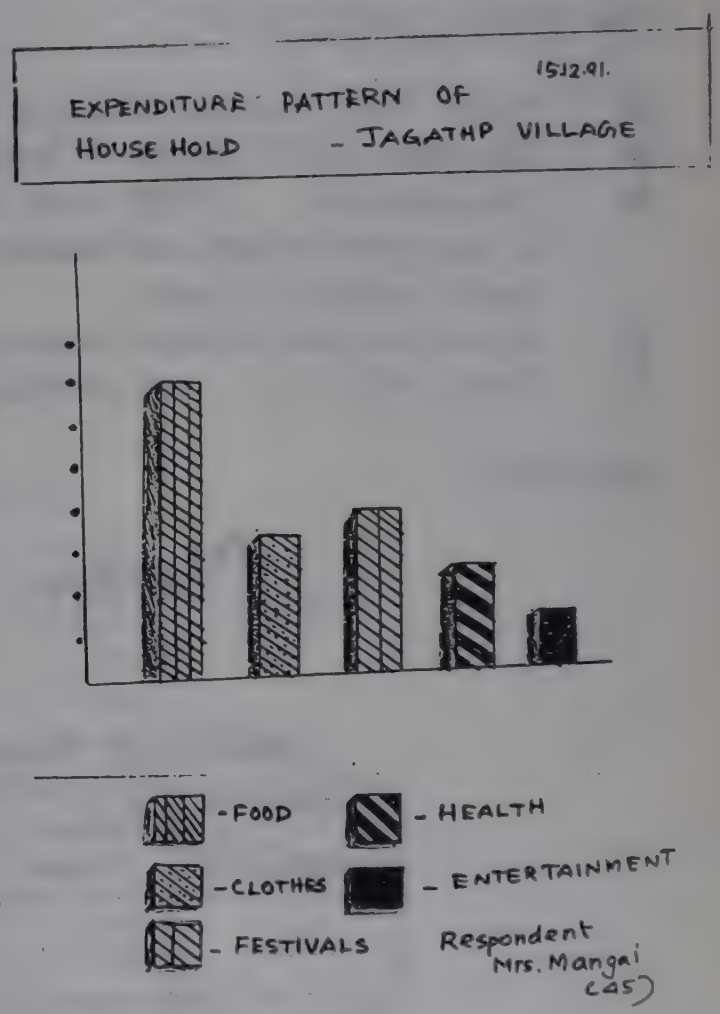

ஜகதாப் கிராமத்தில் நடைமுறை பயிர் திட்டம் மற்றும்
பரிந்துரை பயிர் திட்டம்
PREVALENT AND PROPOSED CROPPING SYSTEM
FOR JAGATHAP VILLAGE
A) IRRIGATED CONDITION
..... SUGAR CANE
SUGAR CANE
RICE
FINGER MILLET (or) PEARL MILLET
RICE
TOMATO
B) DRY CONDITION
TOMATO
COTTON + COWPEA AS BORDER CROP
SAMAI
HORSE GRAM
CHOLAM (LOCAL) + LAB LAB (or) RED GRAM
GROUNDNUT + RED GRAM (or) LAB LAB (or) CASTOR (or) COWPEA
A/M M/J J/J J/A A/S S/O O/N N/D D/J J/F F/M M/A A/M M/J J/J J/A
- Introduction of Intercrops like pulses / cereals
- Introduction of dew loving crops such as bengal gram as sequence crop.

14. Income and Expenditure Patterns

Semistructured interview was used by one group to study the income expenditure pattern of household after explaining the purpose of using PRA method to the villagers. The participants were allowed to select any appropriate materials for showing the pattern of income and expenditure. The women group selected sticks and the men group selected red earth to show the income and blue metal for expenditure. Both the groups were able clearly to identify the pattern of income and expenditure. They were also able to identify the relation between income and expenditure and the size of holding.

FIGURES 13, 14





15. Matrix Scoring: Rice Varieties

During the transect walk, one group came across a group of farmers engaged in harvesting and threshing their paddy crop. The team members interacted with the farmers and others present, and discussed with them the PRA programme. The team explained about the matrix scoring method and asked if the farmers could spare a few minutes to help in assessing the different paddy varieties.

The 5 varieties chosen by the farmers were savala samba, Paiyur-1 (a variety from the Regional Research Station), IR50, bhavani, and IR20. Mr Krishnan, the farmer, scored the matrix on seven criteria, namely yield of grain, shortness of duration, resistance to pests and diseases, straw yield, quality of grain, cost of cultivation and price. Pebbles were used and placed on the matrix drawn on the stone of the threshing floor.

The principal findings were:

- Paiyur-1 was the most preferred variety;
- The grain yield is highest in Paiyur-1;
- The performance of IR20 is not satisfactory in the region - it is a good yielder, but is susceptible to pests and diseases, yields only a small amount of straw and the rice quality and price is poor;
- Straw yield and tolerance to pests and diseases of IR50 is very poor;
- Saval samba had the best cooking quality.

FIGURE 15

MATRIX SCORING

- RICE VARIETIES

JAGATHAP VILLAGE

VARIETIES OF RICE / CHARACTERS	SAVALA SAMBA	PAIYUR - 1	IR 50	BAVANI	IR20
YIELD	00 0 00 0	0000 0000	0000 0000	0000 000	0000 0000
SHORTNESS IN DURATION	00 0 00	00 00	00000 00000	000 00	000 00
RESISTANT TO PEST & DISEASE	00000 0 00000 0	00000 00000	0 0	000 000	00 0
STRAW YIELD	00000 0 00000	000000 000000	00 00	000 000 0	00 0
QUALITY OF GRAIN	00000 00000	00000 00000	00 0	000 000	0 0 0
COST OF CULTIVATION (LOW)	00000 0 00000 0	0000 0 0000 0	00 0	000 00	00 0
PRICE	00 0	00000 00000	00 0	0000 0000	00 0

16. Systems and Flow Diagrams

The flow analysis component of Agroecosystem Analysis was carried out by using PRA methods like flow map and Venn diagrams to see the importance and relationship with them. The related outcome and experiences are given below.

The PRA team was divided into three sub-groups. Before proceeding to the village, the team members and the resource person decided that all the data on social, physical and biological factors should be collected. Throughout the exercise the views of farmers were recorded and the farmers actually drew the flow charts on the ground using the local resources like rangoli powder and plant material.

The farmer's resource flow from outside the farm to both advantageous and disadvantageous groups were recorded. The flow from the farm to outside was also assessed. One farmer depicted milk and groundnut as flows from his farm to outside and diesel, fertilizers and cattle feed as resource flow into the farm by using line drawings and groundnut pods. Another farmer indicated by lines on the ground the resource flows from farm to home and back. He also indicated the output from farm also. This was pictorially represented by the group as a resource plan map.

FIGURE 16

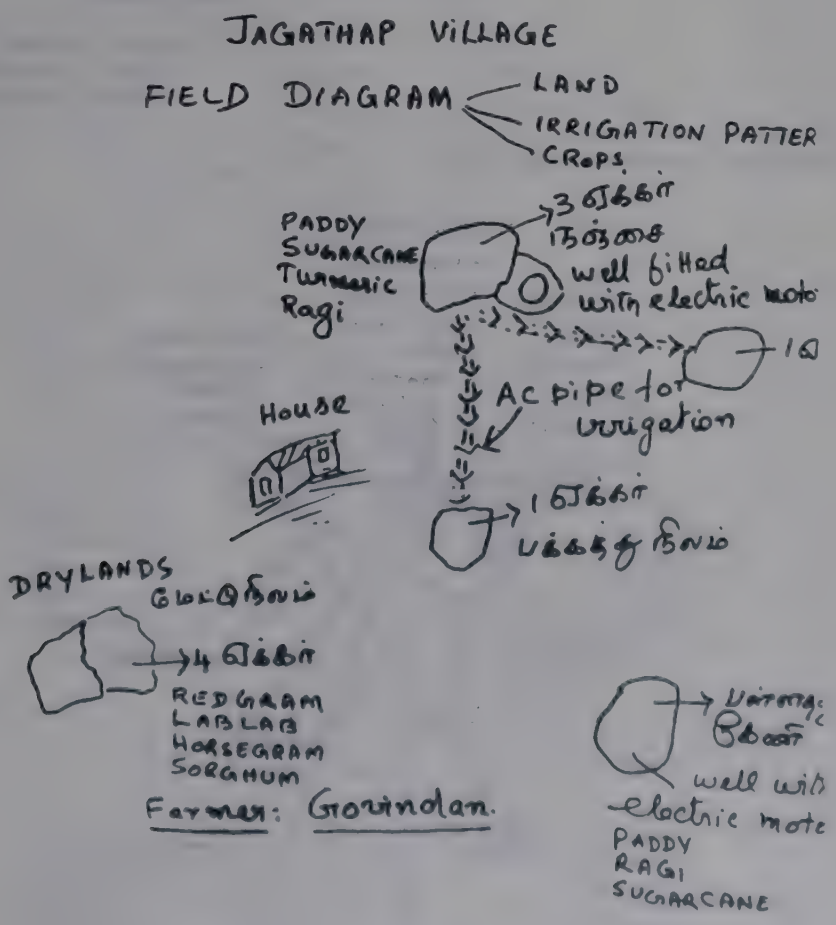
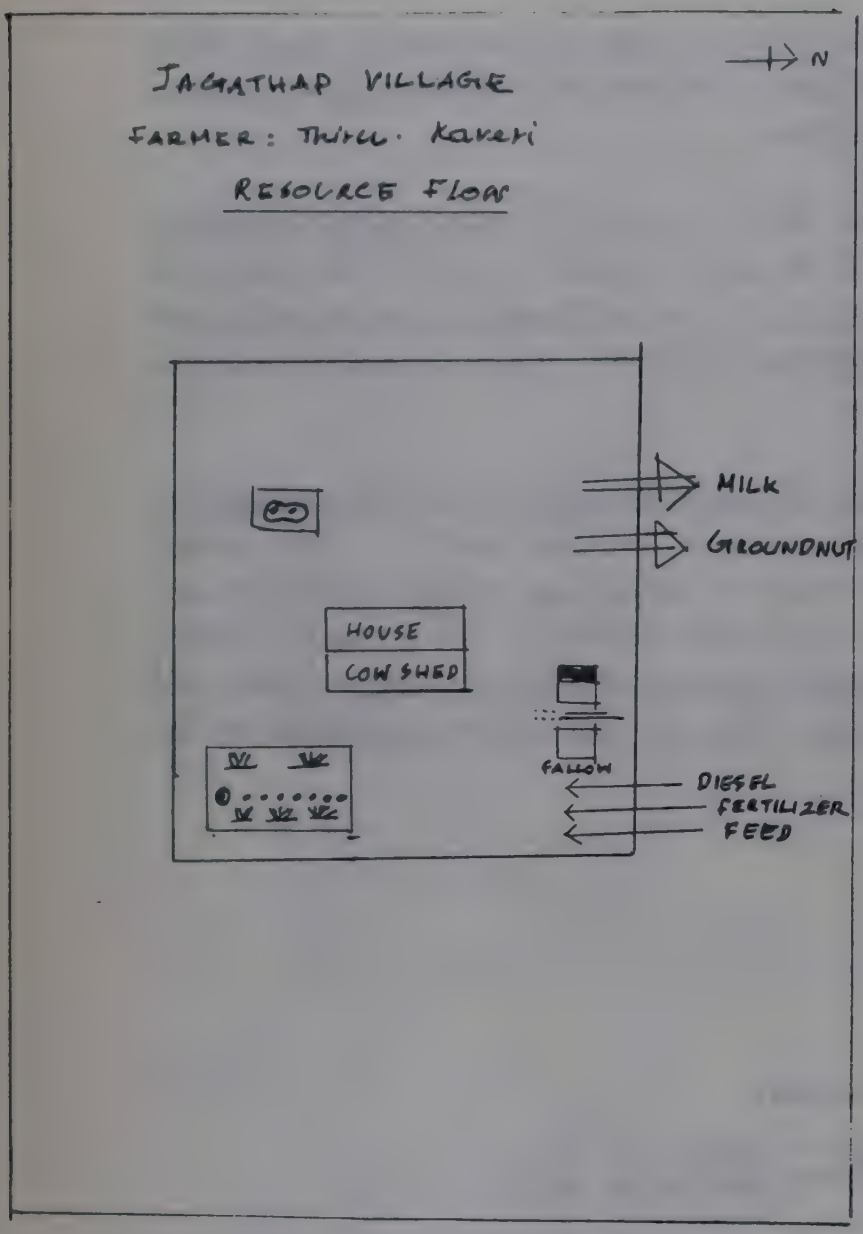
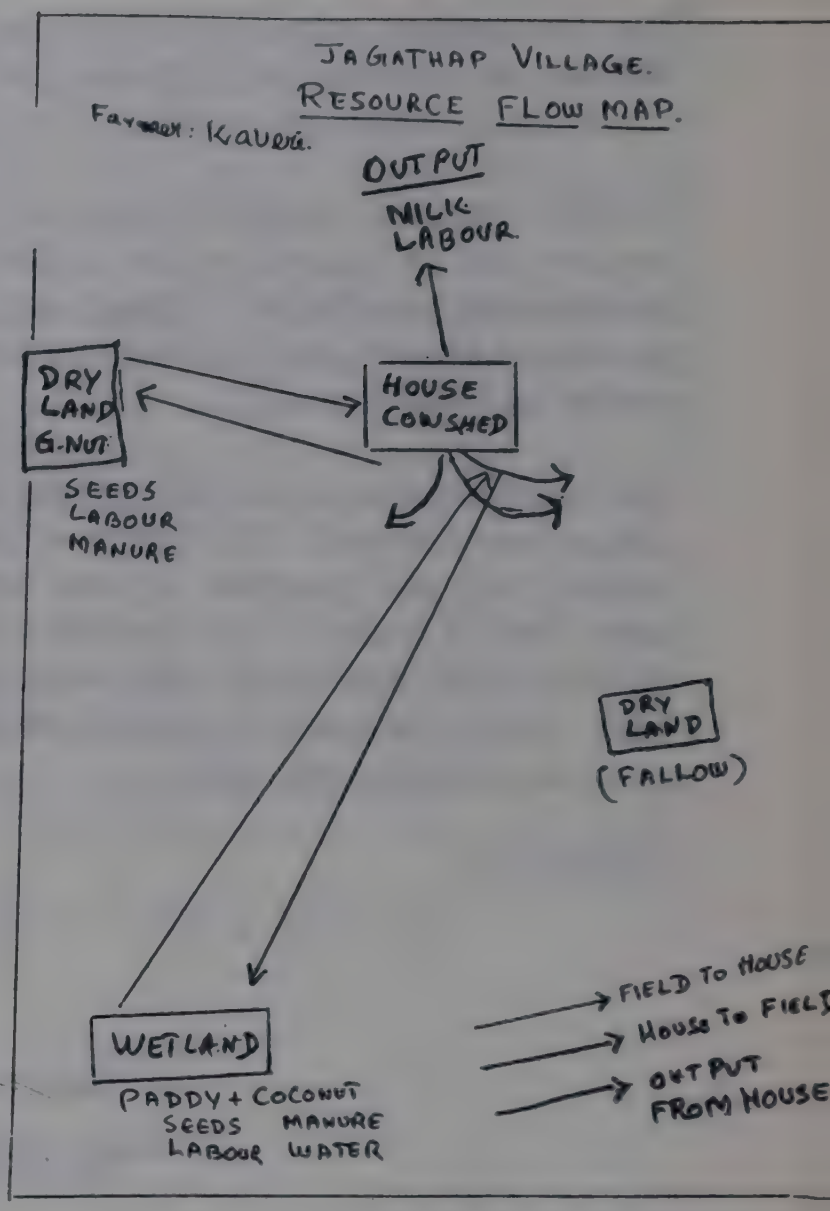
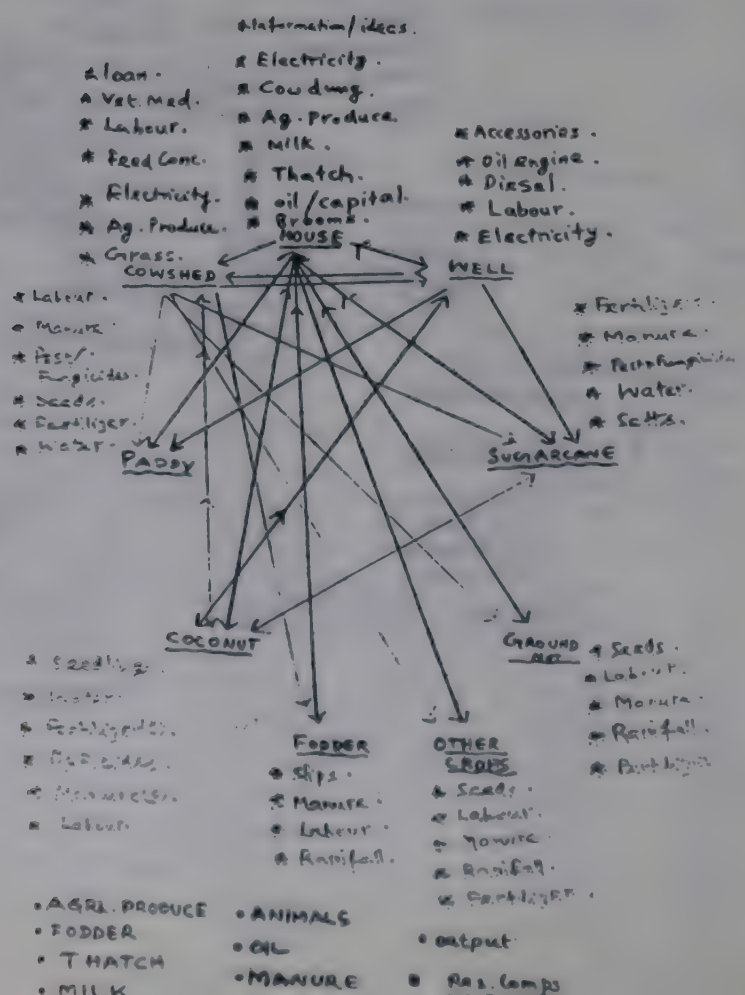


FIGURE 17, 18, 19







17. Nutrient Flow Diagram

Two farmers indicated the nutrient flow diagram by making simple line drawings on the ground. They illustrated the external and internal linkages.

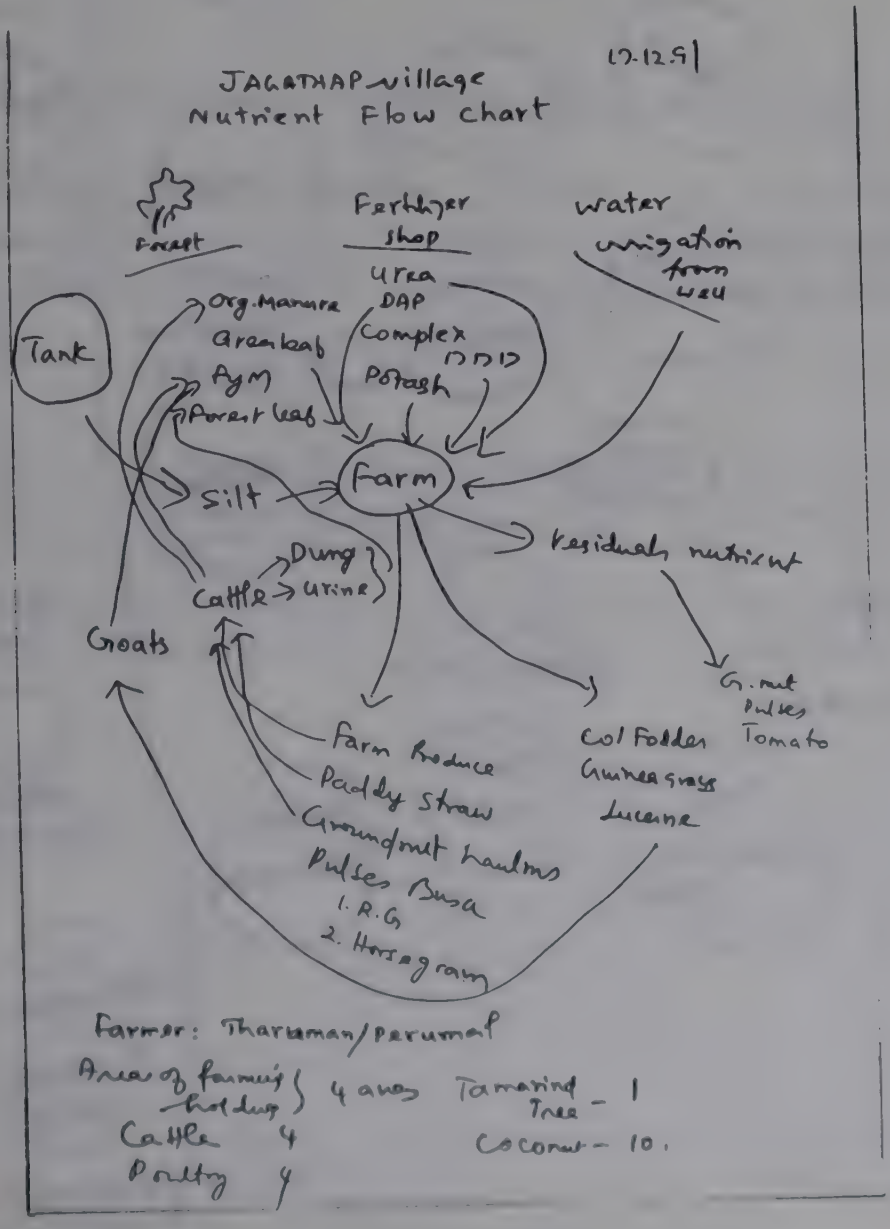
The *external linkages* included:

- urea, DAP and potash bought from the shop and applied to the farm;
- silt applied from the tank to the fields;
- irrigation water from the well;
- green manures (tree leaves and other plant material) collected from the common property resources;
- collected fodder and guinea grass for goat feed;
- milk and other produce sold to local markets.

The *internal linkages* included:

- farm produce, paddy straw, groundnut haulms and pulses haulms for cattle feed;
- manure from cattle and goats for fields.

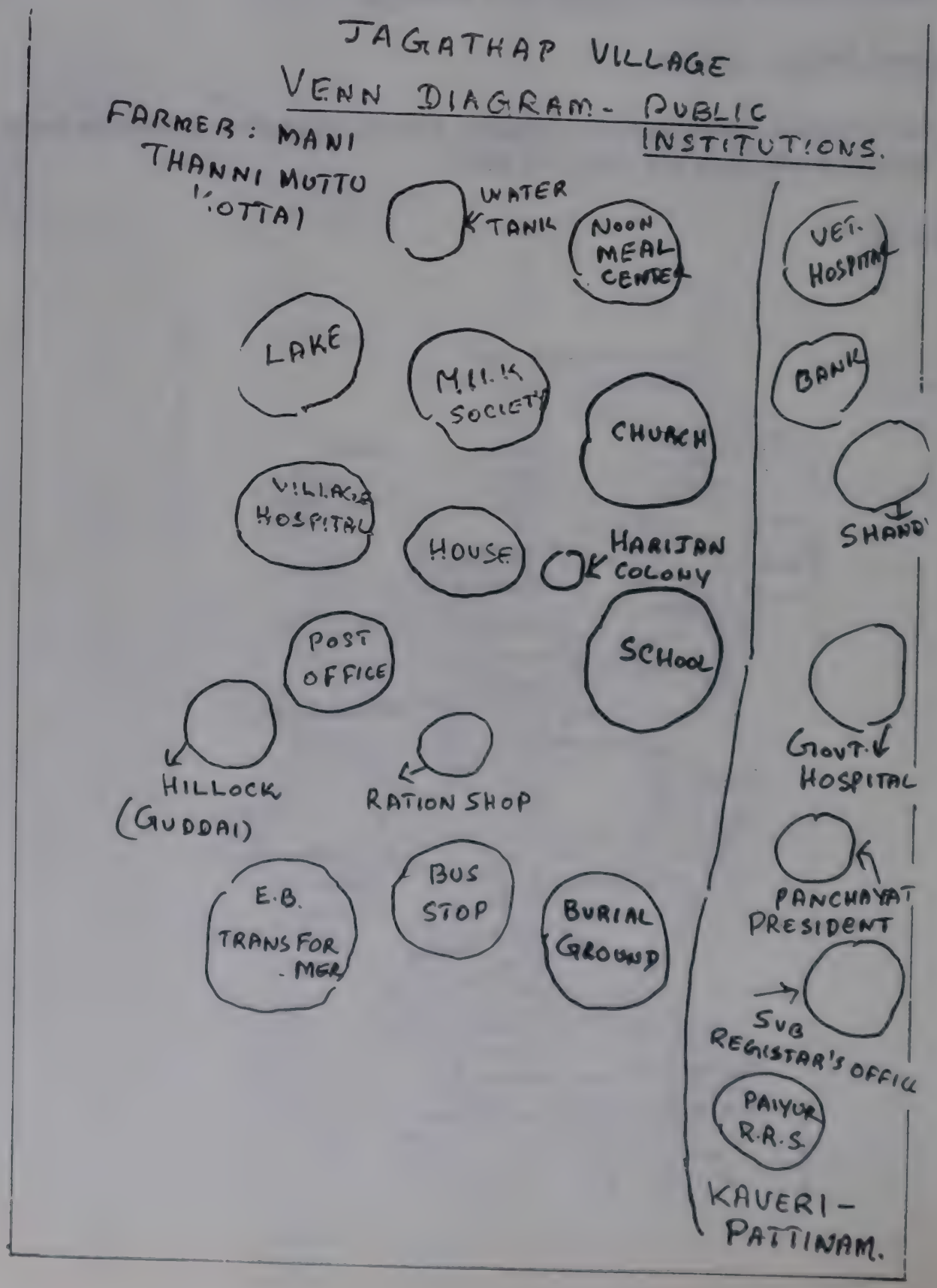
FIGURE 20



18. Venn Diagrams

The sub group found one farmer Mr.Mani in the field and went about doing Venn diagram to indicate the various public institutions with circular discs. Circular discs of various sizes and colours were given to the farmer. First he used a small disc to indicate his house. He used a bigger disc to show church to indicate his interest. He showed burial ground, bus stop, and post office as places of importance. The milk society and school were shown with bigger discs. The veterinary hospital, bank, shandy, govt. hospital, and sub registrar's office in Kaveripattinam were shown in distance with smaller discs. From the Venn diagram it could be interpreted that farmers were able to relate the relationships that they had with various institutions and also the people in the village.

FIGURE 21



19. Instability of Production and Income

The flow diagram analyses led the PRA team to analyse with farmers the critical issue of instability of production and income, and how this varied for small and large farmers.

For a farmer with resource restraints, the year to year instability of biomass production is very high - varying from 0.75 t (1985), to 0 (1986), 1.75 t (1987), 15 t (1988), 5 t (1989), and 0 again (1990). This produces a similar pattern of income instability.

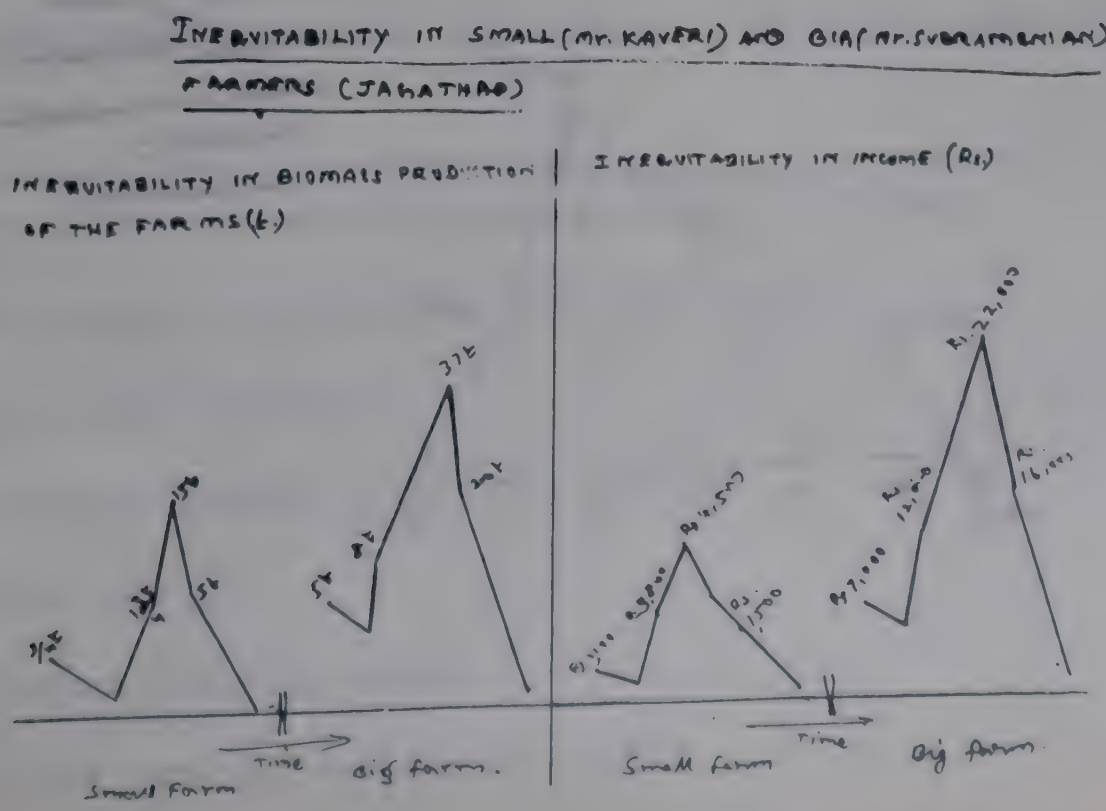
The inequity between large and small farmers is illustrated by the biomass production and income given by 2 farmers (Mr Kaveri & Mr Subramanian):

	Average Production	C V (%)	Average Income	C V (%)
Small	3.75 t	142%	Rs 1560	111%
Large	12.2 t	105%	Rs 10300	70%

The coefficient of variation (CV) = standard deviation / mean * 100

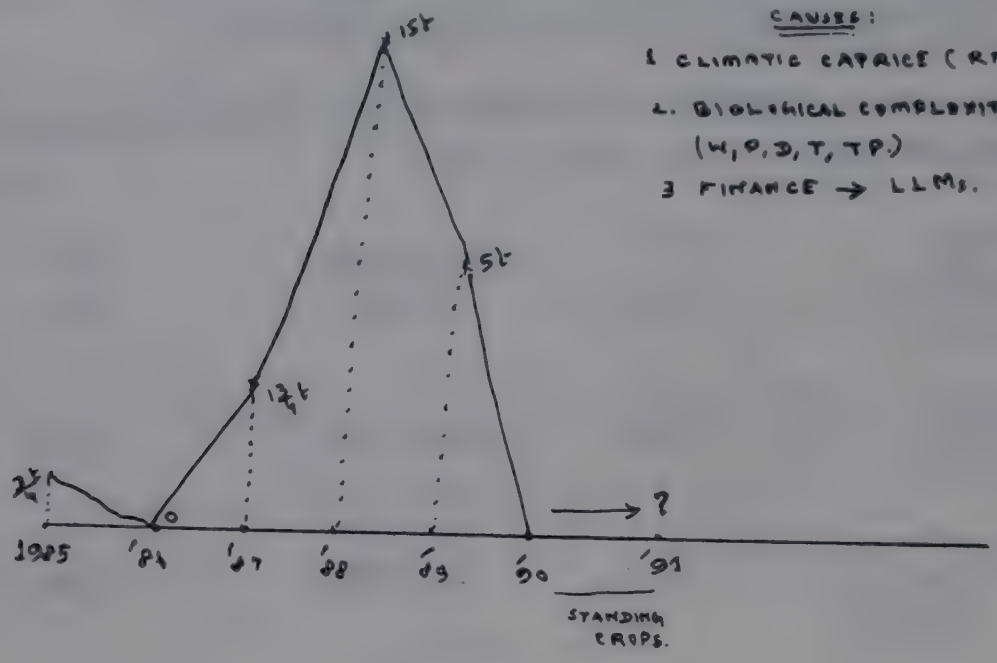
A higher CV indicates greater instability. Clearly, the larger farmer both greater productivity and stability of production. The pattern is even more marked for income, where the larger farmer earns on average six times the small farmer, and is more certain of an income each year.

FIGURE 22



FIGURES 23, 24

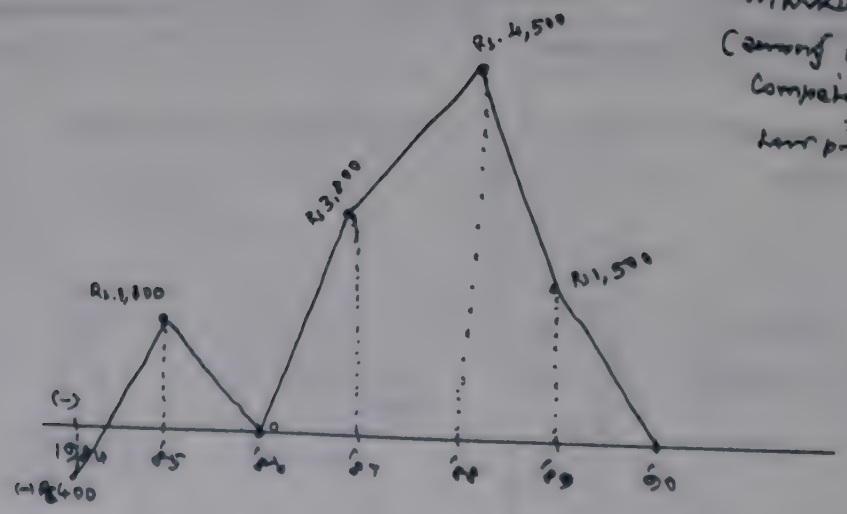
INSTABILITY IN TOTAL BIOMASS PRODUCTION
OF A RESOURCE RESTRAINT FARMER – Mr. KAVERI (JAHATHAP)



CAUSES:
1 CLIMATIC CAPRICE (RAINFALL)
2. BIOLOGICAL COMPLEXITY → BIOL. PERTUR-BATION (W, P, D, T, TP.)
3 FINANCE → LLMs.

INCOME INSTABILITY OF A RESOURCE RESTRAINT FARMER- Mr. KAVERI (JAHATHAP)

∵ of Price fluctuation
↓
market fluctuation.
(among inter components competition).
↓
low productivity.



20. Problems and Opportunities

An attempt has been made in this section to present the major outcome and experiences that emerged out of the PRA on the agroecosystem analysis of Jagathap village. Various PRA methods were employed in generating the information from the informants. Notable among them were map-modelling, semi structured interviews, transect walks, matrix scoring, seasonal analysis, flow diagrams, historical time events, venn diagrams and flow charts. The information obtained from the informants was triangulated with other sources like village information charts, village administrative officer and others.

The PRA team identified both *short-term and long-term problems:*

- Aspiration for better living in economic sense is lacking among the young and old alike. Motivation by extension agencies and development departments is essential, as there is poor involvement at present.

- Employment opportunities for the people of this village are highly inadequate. Semi structured interviews very clearly revealed this point. Starting industries will generate required employment potential for the villagers.

- In the present cropping system, more of an animal component should be introduced to avoid instability in income.

- The underground water potential has not been exploited to the desired level. Tapping underground water sources will result in more income and employment to the villagers.

- The awareness on latest farm technology is lacking and the presence of Regional Research Station, Paiyur can be fully taken advantage of by the farmers to better their farm activities. In this connection adopting the village by some voluntary organisation like MYRADA will solve the problem to a larger extent.

- Input supply system is inadequate. Establishment of institutional support will help in this.

- Credit facilities are lacking and hence starting cooperative banks and/or commercial banks will pave way for better agricultural production in the village.

- Insufficient adoption of soil and water conservation measures.

- No adult education programmes.

- Meagre veterinary facilities.

- No recreation facilities.

- Inadequate land reclamation measures.

- Lack of drought resistant, short duration varieties.

- Delayed payment for farm produce.

The following *opportunities* were made based on the PRA study:

- Rice varieties of short and medium duration are to be evolved to suit to the alkaline soil condition.
- Yield potential of cotton and tomato are not exploited due to drought in the middle of the growth period of the crop. So short duration cotton and tomato varieties need to be evolved.
- Introduction of crops like bengalgram, panivaragu by utilising the dew fall can be explored.
- Area under cash crops especially cotton, sugarcane and Jasmine should be increased.
- Soil and water conservation practices should be taken care of.
- Quick growing trees may be planted in waste lands in the village.
- Constructing a check dam across the existing river will increase the ground water and irrigation potential.
- Exploitation of ground water potential should be done.
- Input supply system needs to strengthened.
- Electrification of the village should be taken up.
- Health care of the animals should be improved.

21. Sustainability Analysis

The sustainability of farming systems in Jagathap village is promoted by both the integrated nature of the farms and the indigenous knowledge already existing.

The following components of indigenous farming practices are contributing to sustainability:

- Bund, border, mixed, inter, ley, alley cropping;
- Tree growing (reserve bank);
- Goat rearing (mobile bank);
- Employment generation;
- Organic recycling;
- Diversity of crops and varieties;
- Not plastering the surrounding area of open wells so as to recharge the groundwater;
- Hill stones are placed along the field bunds of uplands to prevent soil erosion and water runoff;
- Locally available hill grass (*bodha*) is used as roofing material;
- Wild plants are used as green manures;
- Work bullocks and cows are shoed for puddling because of rocky soils.

Sustainability matrices were produced for small and large farmers.

FIGURES 25, 26

SUSTAINABILITY ANALYSIS (JAGATHAP VILLAGE)

BIG FARMER (Adv. groups): 10 ac. (Dry + wet.)

Fmg. syss. activities	Goals & obj.	Output indicators	Impact indicators	EXISTING SYS.		Res. / Extn. / Policy Response		
				Strengths	Weaknesses	? should be continued	? new activities to be started	? should be stopped
Rice - GN/Tomato Sugarcane Coconut- Cattle (6 Work bullocks + 2 milch cows)	· Aiming commercial farming.	· Yield: Paddy, S.cane, GN, Coconut, Tomato · Dry fodder · Husks · Concentrate · Milk	· Purchase of lands, Jewels.	· Diversified farming · Periodical cash flow · Inter resource flow is more · Avail. of org. manures	· Specialisation in cropping not possible · Harvesting S.cane depends on cutting order from factory. · Land utilization is poor. · Weed control	Research: · Existing Res. should continue. Extension: · Exis. Extn. activities to be geared. Policy: · Energising wells.	· High yielding Vars. in S.cane & Rice. · Reasons of low yd of IR 50, IR 20 to be studied · Training on IFS. → · use of bio-fert. · Herbicides. · Agro based industries → · credit support.	— — —

SUSTAINABILITY ANALYSIS.

Small Farmer (Disadv. group): 1.30 ac. (JAGATHAP VILLAGE)

Fmg. syss. activities	Goals & obj.	Output indicators	Impact indicators	EXISTING SYS.		Res. / Extn. / Policy Responses		
				Strengths	Weaknesses	? should be continued	? new activities to be started	? should be stopped.
GN. + Castor(r) + Redgram(r) - Milch animal (one N.g.)	· Safety, · Avoiding risk, aiming for self sufficiency	Yield - · Groundnut, · Castor, · RG. · Haulms · Milk	· Change in Std. of living. · CB. animal	· Appln. of Org. manure · Inter-cropping · Soil fert. improvement	· Maint. of local cow. · Poor pl. popln. · low fert. appln.	Research: · Evol. Vars. GN. Extension: · Strengthening Extn. activities Policy: · Sale of seeds/ inputs thro' Agl. Dept.	— · OFT → · Training progs. on GN. → · OFT → on IFS. · Rainf. Fgn. · IPM on GN., Rg. & Castor → · Finance	— — Inputs subsidy should be stopped.

4. PRA OF KARAGUR VILLAGE IN DHARMAPURI DISTRICT

K Natarajamoorthy
C Chinnuswamy
P Nasuredeen
N Shanmugavalli
R Ganesan
V A Sakunthala
Janardhana Rao
K C John

1. Introduction to Karagur Village

Karagur village is situated 6 km away from Paiyur of Kaveripattinam block in Dharmapuri district. It is a hamlet of Paiyur II revenue village which also consists of eight more hamlets, namely Sappanipatti, Bommasamudram, Kandalampatti, Uthupallam, Sappanipatti colony, Bommasamudram colony, Melur and Panchalapuram. The road leading to Karagur village joins National Highway 7 after crossing Sappanipatti. The village is located exactly at a distance of 1 km from NH 7.

Total area of the village is 350 acres, of which cultivable area forms 250 acres. The buildings occupy 10 acres. The tank covers an area of 15 acres. There are 75 acres of marginal lands around the hillock, which remains fallow due to its poor status of soil fertility. Of the 250 acres of cultivable land, 50 acres is under irrigation, the sources of irrigation being either open wells or tanks. An area of 150 acres is under rainfed condition and salt affected lands occupied 50 acres which are mostly found in the ayacut area of the tank.

The total population of the village was at first thought to be 216 with 82 men, 85 women, 18 boys and 31 girls. On the third day the group found that there was one more family residing in the farm, which was pointed out by a farmer. So the total population was found to be 222. All the families of the village belong to the *vellala Gounder* community of Hindu religion which is a rare feature.

There is one primary school in the village. For high school education the children of the village have to go to Sopanur, 3 km east of Karagur. Kaveripattinam and Karimangalam have facilities for higher secondary education. They have to go to Krishnagiri or Dharmapuri for college education. It is interesting to note that even with all these constraints, 75% of boys and 25% of the girls are educated.

The team visited the village and collected information through semi-structured interviews and adopted the following PRA methods after locating key informants in the village system:

- Time line
- Historical profile
- Historical transect
- Crop biographies

- Seasonal analysis of rainfall, Agrl.labour
- Crop calenders
- Income/Expenditure profile of typical cases
- Indigenous knowledge system.
- Resource flow-in existing production system
- Nutrient flow-in existing production system
- Venn diagram
- Decision tree
- Productivity time line

Before taking up the visit to the village the PRA team defined the following team contract:

- *Be punctual*
- *Active participation in all exercise*
- *Rotational leadership every day*
- *Reconstitution of sub groups every day*
- *Setting objectives every day*
- *Reviewing the performance every day*
- *Document the processes every day*
- *Preparation of check list for the next day.*

2. Transect Walk

When the team visited the village for the first time, only one informant was available. Hence instead of initiating the mapping of the village, the team changed the strategy to have an overall view of the village. The team and three more informants climbed up Karimalai hillock on the northern side of the village to have a bird's eye view of the entire village. This change in the planned programme is an indication of the flexibility adopted in PRA.

The group then divided into two sub groups and conducted transect walks in two different directions accompanied by the villagers. By employing semi structured interview details were collected on topography, crops, cropping-pattern zones, soil-type and fertility status, farming constraints etc.

3. Participatory Village Mapping

On arriving at a common place, the team requested the villagers to map out the farm and home locations, roads and social institutions by adopting their own classification. They used live plant materials to indicate the various crops grown in the village. They used bricks to mark the houses and demarked the terraced, tiled and thatched houses appropriately with different colour powders. They used different seeds to indicate the population and literacy level for members of all households. The social map was used subsequently as the base material for further probing and analysis.
The village mapping process was as follows:

1.10 pm 1. Initial discussions with informants;

2. Selection of a place and cleaning of site;

3. Start with roads and boundaries;

4. Involvement of women - use of rangoli;

5. Involvement of children - supply of materials;

6. Houses laid out - differentiated according to concrete, tiles, thatched;

7. Population by household marked

8. Simultaneously crops laid out

9. More details added by children - electric lines, tank;

10. Wealth ranking initiated by three men;

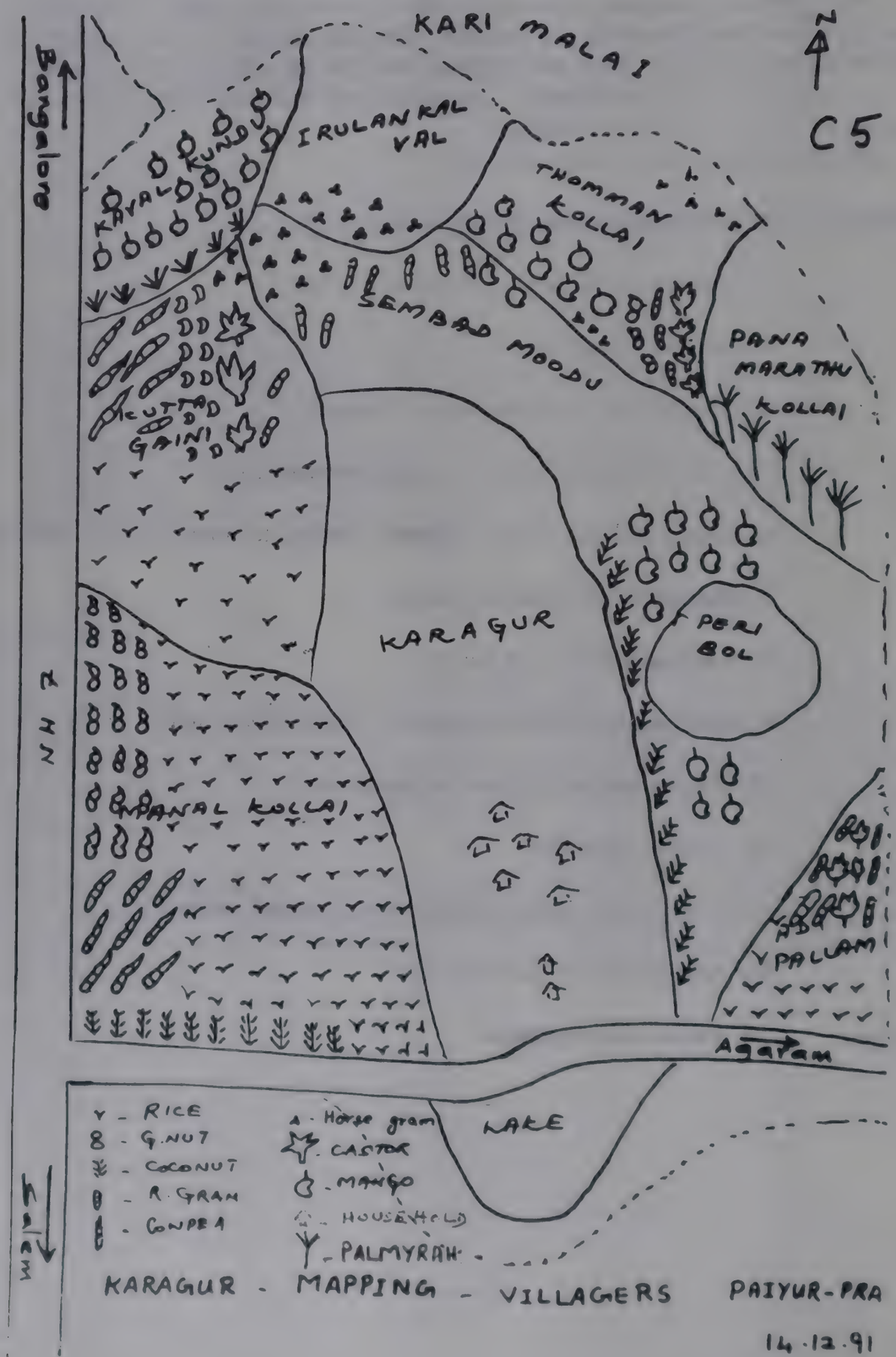
11. Criteria discussed;

12. Classification into 4 groups using coloured cards;

13. Analysis of the resource map

5.10 pm 14. Thanks and departure.

FIGURE 27


KARI MALAI
N
C5
Bangalore
IRULANKAL VAL
KAVAL KUNDU
THOMMAN KOLLAI
SEMBAD MOODU
PANA MARATHU KOLLAI
CUTTAD
GAINI
KARAGUR
PERI BOL
PANAL KOLLAI
PALLAM
Agaram
LAKE
Salem
R - RICE
G - G.NUT
C - COCONUT
R - R.GRAM
C - CONPEA
H - Horse gram
CASTOR
MANGO
HOUSEHOLD
PALMYRAH
KARAGUR - MAPPING - VILLAGERS
PAIYUR-PRA
14-12-91

4. Social Mapping and Wealth Ranking

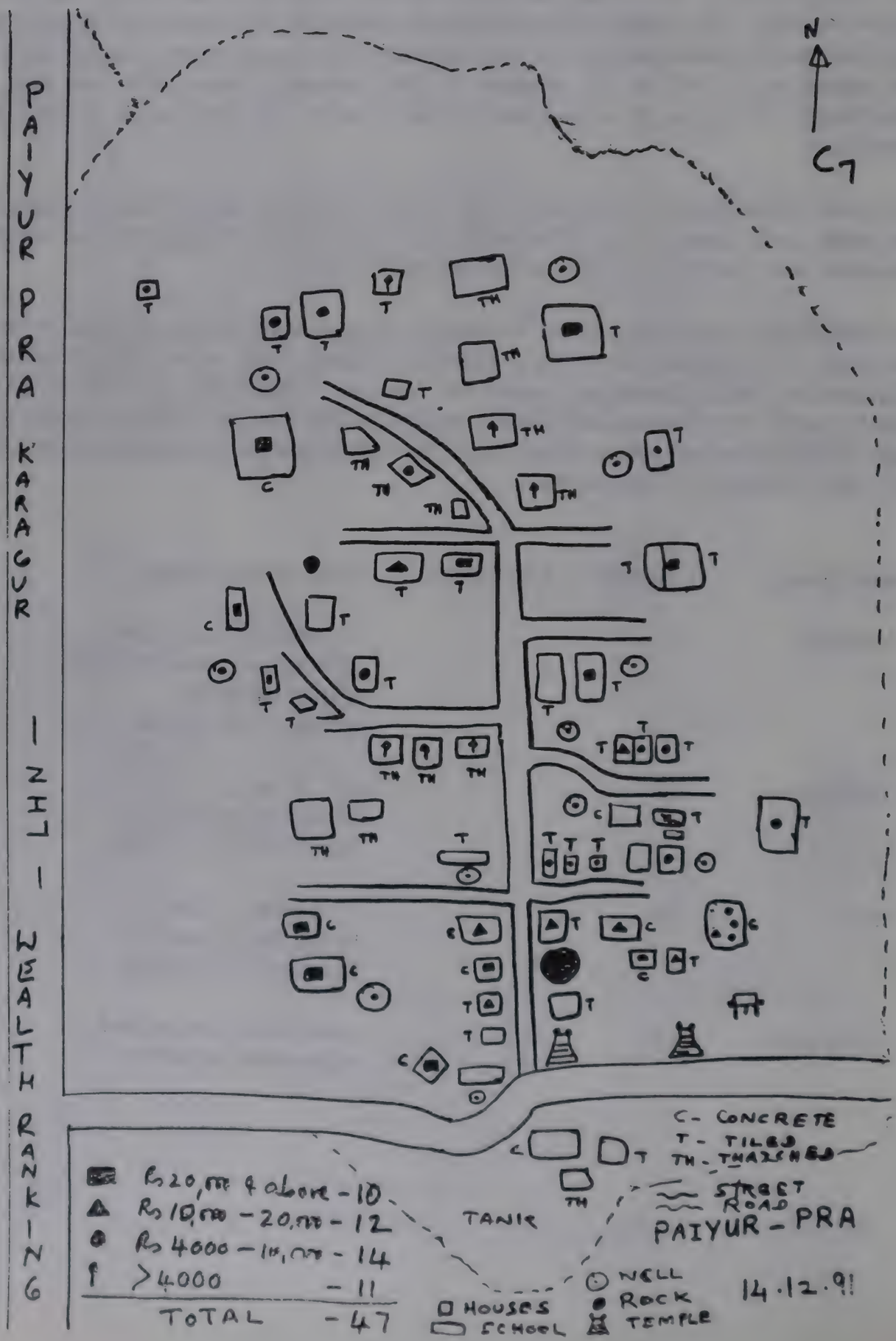
The PRA team employed semi-structured interviewing and participatory mapping to help the villagers classify into four economic groups as rich, medium, poor and very poor based on their annual income. They indicated their economic group by using different colour cards laid on the map. The details on householdwise population was marked by three villagers, Raja, Kasturi and Pandurangam, by using different seeds such as castor, cowpea, black gram and greengram to indicate the numbers of men, women, female child and male child respectively. This gave 82 adult males, 85 adult women, 18 boys and 31 girls for the 52 households.

The whole population was classified by the farmers as literate and illiterate by using castor and paddy seeds respectively. The details such as collegiate, high school and elementary education were collected by semi structured interviewing.

By triangulation, the exact number of houses and population were confirmed by the first sub-group. The literacy level was assessed as primary, high school and collegiate level education by placing greengram, castor and cow pea respectively. In order to know the literacy status, the illiterates and literates were identified first and differentiated by placing seeds of blackgram and paddy respectively. The whole process was carried out by a farmer and a boy assisted by a farm woman.

Wealth group	*Number of households*	*Assets* and Activities
1 - wealthy	10	15 acres of land or more 100 bags of groundnut yield Mango orchards Income > Rs 20,000
2 - Middle	12	10 - 15 acres of land 25 bags of groundnuts Income Rs 10 - 20,000
3 - Poor	14	1 - 5 acres of land 10 bags of groundnuts Income Rs 4 - 10,000
4 - Very poor	11	Less than 1 acre of land Agricultural labourers

FIGURE 28


PAIYUR PRA KARAGUR - NH1 - WEALTH RANKING
N
C7
C- CONCRETE
T- TILED
TH- THATCHED
STREET ROAD
PAIYUR - PRA
TANK
WELL
ROCK
TEMPLE
HOUSES
SCHOOL
Rs 20,000 & above - 10
Rs 10,000 - 20,000 - 12
Rs 4000 - 10,000 - 14
>4000 - 11
TOTAL - 47
14.12.91

5. History of Village

Through a semi structured interview with Thiru Vetaraya Gounder, the history of the village was traced. It dates back to 1750. The present population originated from four families according to the respondent. One vellala family came from Goodur in 1900 to settle. All the 52 families belong to a homogenous caste group of Vellala Gounder.

One case study of a villager was conducted. To administer this method an elderly person, Mr.Vettaraya Gounder was contacted and his responses were obtained by semi-structured interview. He traced every happenings since his birth, ie.1932. The information was related to the village system by the respondent.

FIGURES 29

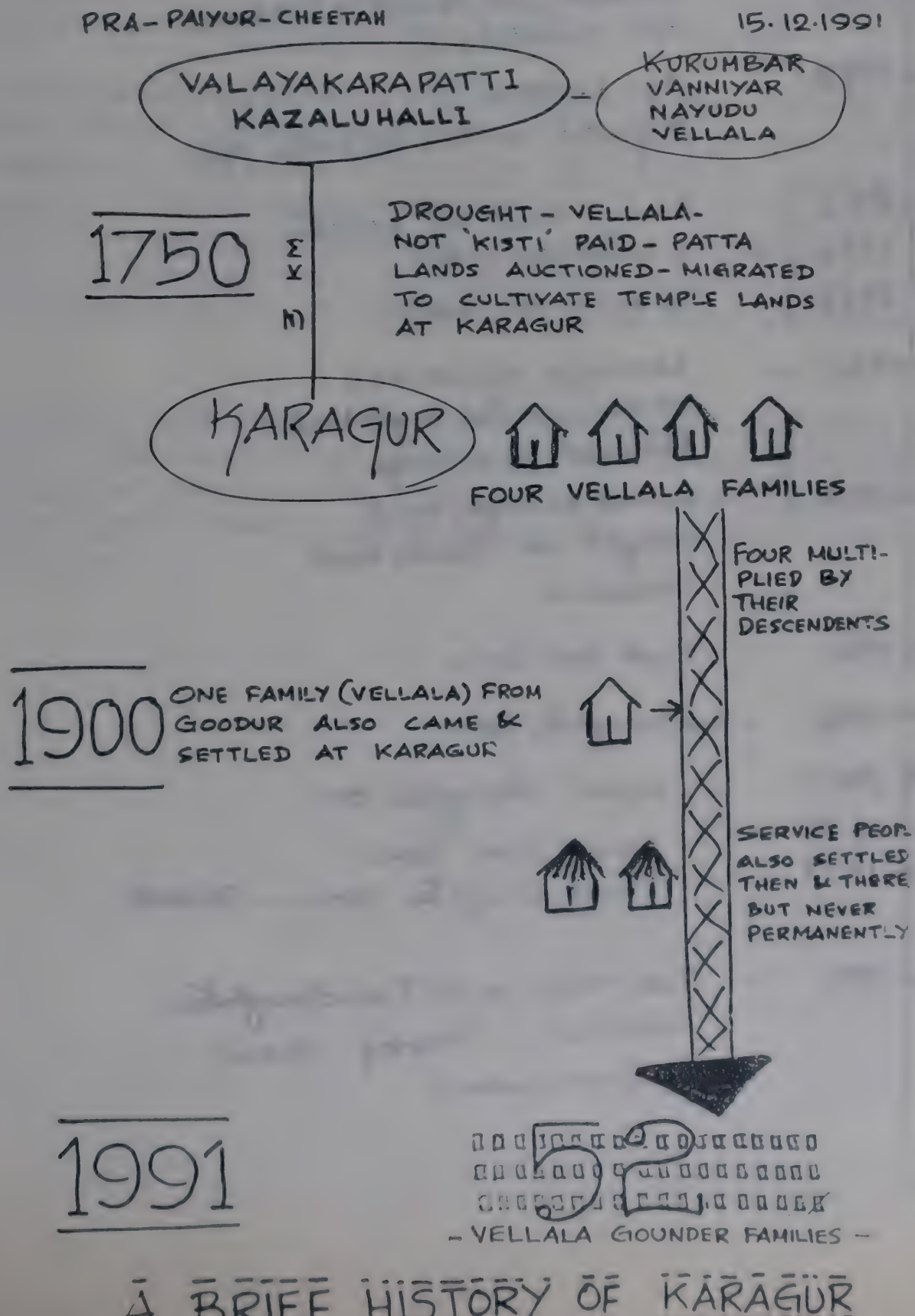
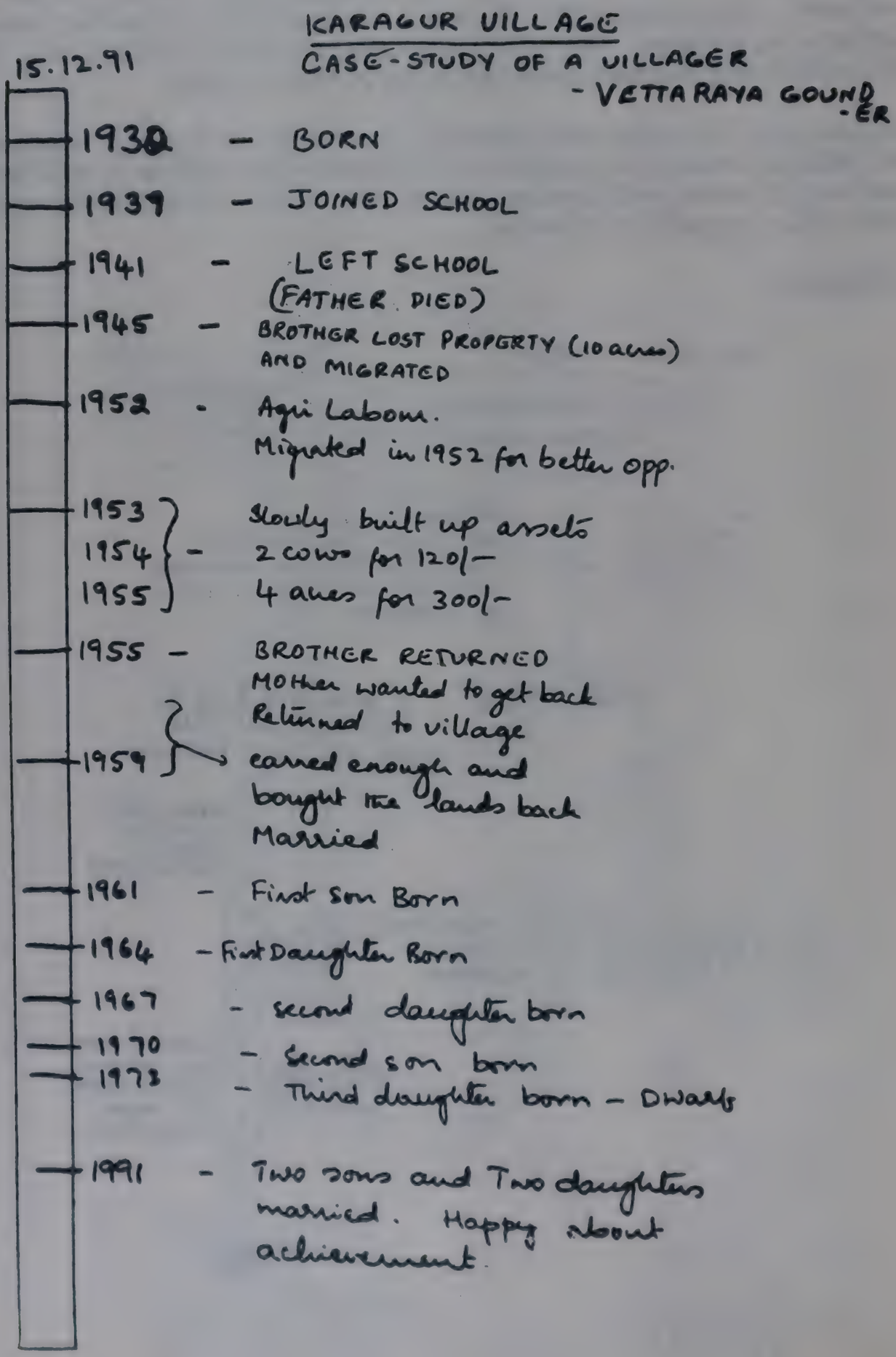


FIGURE 30


KARAGUR VILLAGE
CASE-STUDY OF A VILLAGER
- VETTARAYA GOUNDER
15.12.91
1930 - BORN
1939 - JOINED SCHOOL
1941 - LEFT SCHOOL (FATHER DIED)
1945 - BROTHER LOST PROPERTY (10 acres) AND MIGRATED
1952 - Agri Labour. Migrated in 1952 for better opp.
1953
1954 - 2 cows for 120/-
1955 4 acres for 300/-
Slowly built up assets
1955 - BROTHER RETURNED
Mother wanted to get back
Returned to village
1959 earned enough and bought the lands back
Married
1961 - First Son Born
1964 - First Daughter Born
1967 - second daughter born
1970 - Second son born
1973 - Third daughter born - DWarfs
1991 - Two sons and Two daughters married. Happy about achievement.

6. Historical Transect of Crops

Through semi structured interview, the key informants could trace the cropping pattern of the village in different resource zones from 1945. A perspective was also presented by analysing the farmer's experience and expectations.

The assigned task of historical transect was attended by the second sub-group. One Mr.Venkata Gounder, aged 85 (Res.I) and Mrs Malliamma, (Res.II) aged 68 were interacted. Respondent I, a native of Karagur village when asked about his experiences from his childhood onwards, he remembered the fifties and went on giving the information regarding the transformation that occurred in the village over a period of time. The information included the type of crops, introduction of crop varieties, changes in living styles; nature of housing, new caste settlements, change from mhotes to energised pumpsets, new cropping sequences, inclusion of sericulture and sugarcane, change from organic manures to fertilizers, recurrence of droughts, dominance of political parties, presence of school and the latest addition to the village, namely an overhead tank.

The triangulation with respondent II who inhabited the village only after her marriage corroborated with the expressions of respondent I in many of the areas. She remembered the introduction of Bose plough to the village during 1981 and tractor in 1987. The replacement of local paddy varieties by Bhavani and IR 20 during 1970 was expressed. She pointed out the existence of spreading type of groundnut in the village during 60's. Cross bred cattle were introduced in the village during 1975 and farmers took up dairy as the secondary source of income. The profitability of raising tomato was known only during 1976.

In another exercise, more historical information was gathered by semi-structured interviewing with the help of elders in the village. The information over a period of fifty years was given by the respondent covering number of families, irrigation sources available educational facilities, crops grown, livestock, standard of living, etc. The changes occurred over period were noted down.

FIGURES 31, 32

15.12.91

HISTORICAL TIMELINE OF FAMILIES, IRRIG., EDN, CROPS, ANIMALS & HOUSES

Period	No. of Families	Irrigation Sources	Education	Crops	Animals	Houses
1930-45	40	T, W, R	NO SCHOOL	Paddy (old) S.cane (Nama) Banana, brinjal chillies ..... G.nut (Kodi) Gingelly, cumbu, cholam, G. Gram	400 (Draught + milch)	
1946-60	45	T, W, R	1948 V (cons. by villagers)	Paddy (old) coconut S.cane (vellam) Brinjal, chillies ..... G.nut (Kodi) Gingelly, cumbu, cholam, Greme, Horse gram	350 (Draught + milch)	
1961-75	50	T, W, R	1961 V (Govt.)	S.cane (Mill) Paddy (old) banana Sericulture ..... G.nut (Kuthu) R. gram, castor	200 (Draught + milch)	
1976-91	52	T, W, R	1982 VIII Addl.	Paddy (New) S.cane (mill) ..... G.nut (Kuthu) R. gram, castor, lablab, H.gram	100 (Mostly milch)	

PAIYUR PRA
15.12.91

HISTORICAL TRANSECT OF CROPS

	IRULANAKALVAL	KAVAL GUNDU	SEMBAD MODU	KUTTAGAINI
1945	SAMAI VARAGU DENGRAM	SAMAI VARAGU DENGRAM	SORGHUM R.GRAM D.GRAM	CUMBU, SORGHUM
1960	SAMAI H.GRAM	CUMBU COWPEA DENGRAM	CUMBU RAGI H.GRAM COWPEA	PADDY, SORGHUM G.NUT (spreading)
1975	G.NUT SORGHUM R.GRAM	G.NUT COWPEA R.GRAM.	G.NUT COWPEA R.GRAM.	PADDY, FLOWERS G.NUT, SORGHUM
1990	G.NUT SORGHUM R.GRAM MANGO	G.NUT COWPEA R.GRAM TOMATO	G.NUT COWPEA TOMATO R.GRAM.	PADDY, FLOWERS G.NUT, SORGHUM TOMATO
2000 [FUTURE PROJECTION]	MANGO H.GRAM	G.NUT R.GRAM MANGO	MANGO G NUT R.GRAM	PADDY, FLOWERS COCONUT

7. Matrix scoring: Tomato Varieties and Paddy Varieties

The matrix scoring for the two major crops of the village, tomato and paddy, was made by the farmers including farm women. The respondents made choices over the various traits of different varieties of two crops and indicated their preferences by placing the locally available materials such as groundnut pods and castor seeds in the matrix boxes.

One farmer and two farm women ranked eleven different varieties of paddy according to seven criteria - early harvest, taste, yield, price, popping, straw and resistant to pest and diseases. The most preferred is Ponni, followed by Kichdi and IR50, mainly because the satisfy most criteria. Pangu and Bhavani are grown for their popping quality. The poorest for resistance to pests and diseases is IR20, and so is disliked even though it is short duration and yields well.

For the tomatoes, PKM-1 was the most preferred and Paiyur-1 the least. PKM-1 scored well on most criteria, though has fewer fruits and stores marginally less well than the Rubali hybrid. Paiyur-1 scores well on yield and earliness, but it does not store well, is less tolerant to pests and is costly to cultivate.

FIGURE 33

MATRIX RANKING/SCORING OF PADDY VARIETIES.

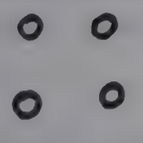
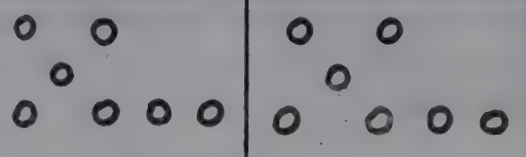
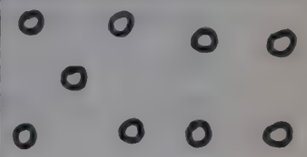
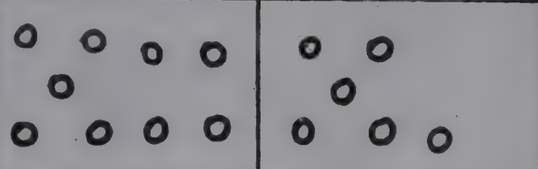
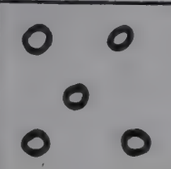
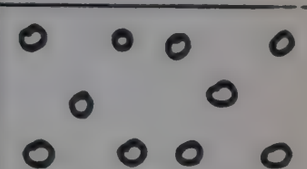
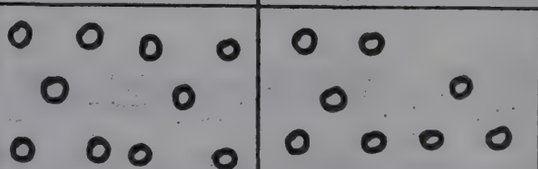
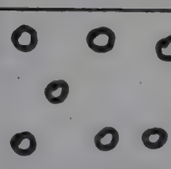
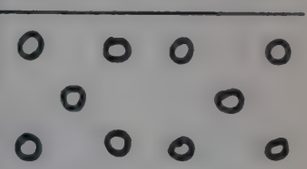
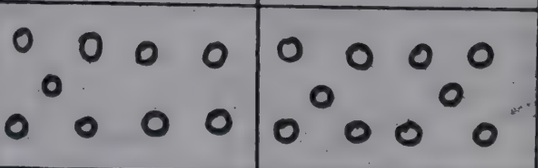
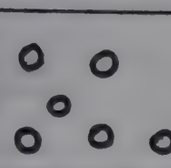
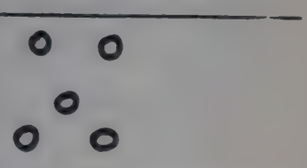
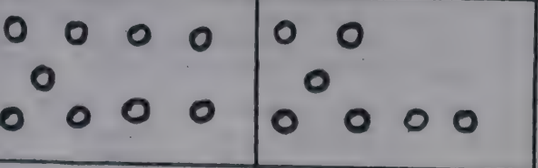
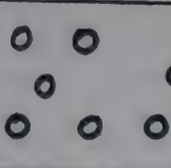
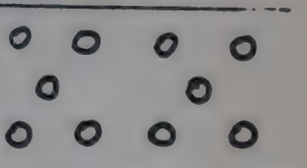
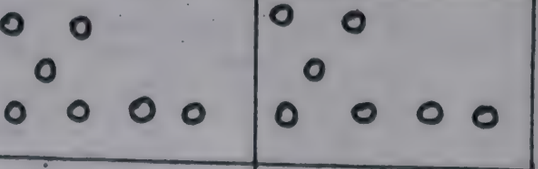
KARAGUR 15.12.91

PADDY VARIETIES / HARACS.	1 1½ PANGU பங்கு	2 KICHDI கிச்சடி	3 SEVAL SAMBA சேவல் சம்பா	4 BLACK RICE கருப்பு கவுனி	5 PILLAN CHIMBA	6 RED RICE சிகப்பு	7 I.R.20	8 BHAVANI பவானி	9 PAIYUR-1	10 IR-50	11 PONNI பொன்னி
EARLY HARVEST	○○ ○○	○○ ○○	○○○ ○○○	○○○ ○○○	○○○ ○○○	○○ ○○	○○○○ ○○○○	○○○ ○○○	○○ ○○	○○○○○ ○○○○○	○○ ○○
TASTE	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○ ○○	○○○ ○○○	○○○ ○○○	○○○○○ ○○○○○	○○○○ ○○	○○○○ ○○○	○○○○ ○○○○	○○○ ○○○	○○○○○ ○○○○○
YIELD	○○○○○ ○○○○	○○○ ○○	○○ ○○	○	○○○○	○○○ ○○	○○○○ ○○○	○○○○ ○○○○	○○○○ ○○	○○○○○ ○○○○○	○○○○○ ○○○○○
PRICE	○○○○ ○○○	○○○○○ ○○○○○	○○○○ ○○	○○○○		○○○ ○○	○○○○ ○○○	○○○○ ○○○○	○○○○○ ○○○○	○○○ ○○○	○○○○○ ○○○○
POPPING	○○○○○ ○○○○○							○○○○○ ○○○○	○○		
STRAW Ht.	○○○○○ ○○○○○	○○○○ ○○○	○○○○○	○○○○	○○○○ ○○	○○○○ ○○	○○	○○○○ ○○	○○○○○ ○○○○○	○○○	○○○○○ ○○○○
Resistance to Pest & Dis.	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○	○○○○ ○○○	○○○○○ ○○○○	○○○○ ○○○○	○○○○ ○○○	○○○○ ○○○○
Overall Pref.		II								III	I

FIGURE 34

MATRIX SCORING.

PREFERENCE OF TOMATO VARIETIES

CHARACTER	PKM-1	PUSA RUBY	PAIYUR-1	RUBALI (HYBRID)
EARLINESS				
NO. OF FRUITS				
KEEPING QUALITY				
YIELD				
TOLERANCE TO PEST + DISEASES				
PRICE				
COST OF CULTIVATION				
OVER ALL RANKING.	I	II		III

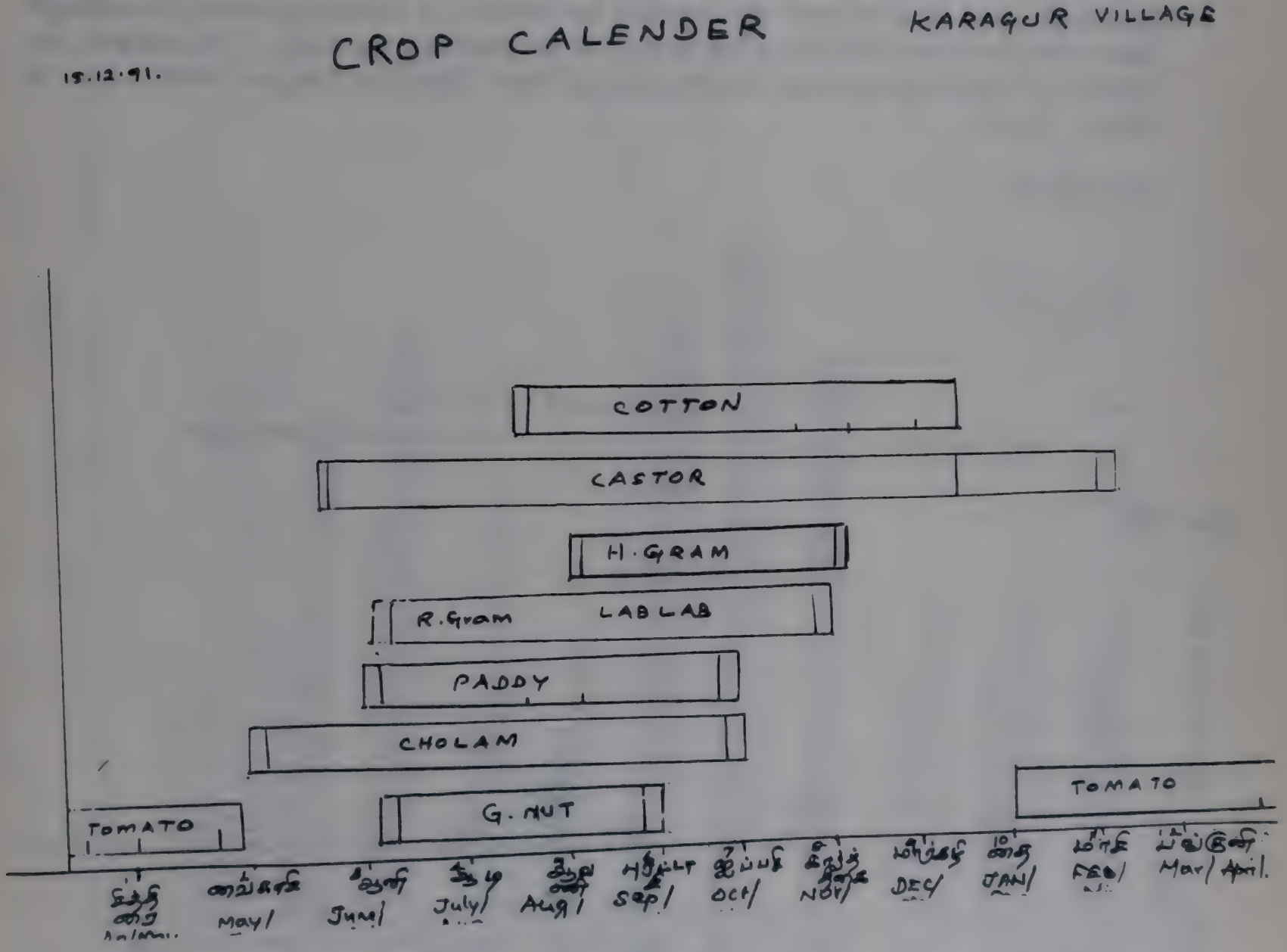
INFORMANT : GANAPATHY
RADHAMMAL
KASTHURI

PRA TEAM: CHEETAH GROUP

8. Crop Calenders

The twelve Tamil months of the year were marked and accordingly the crop raised by the farmers in different seasons were plotted. The sowing period and the harvest were also demarcated by them. After plotting all the details, the farm women marked the lines with coloured powders.

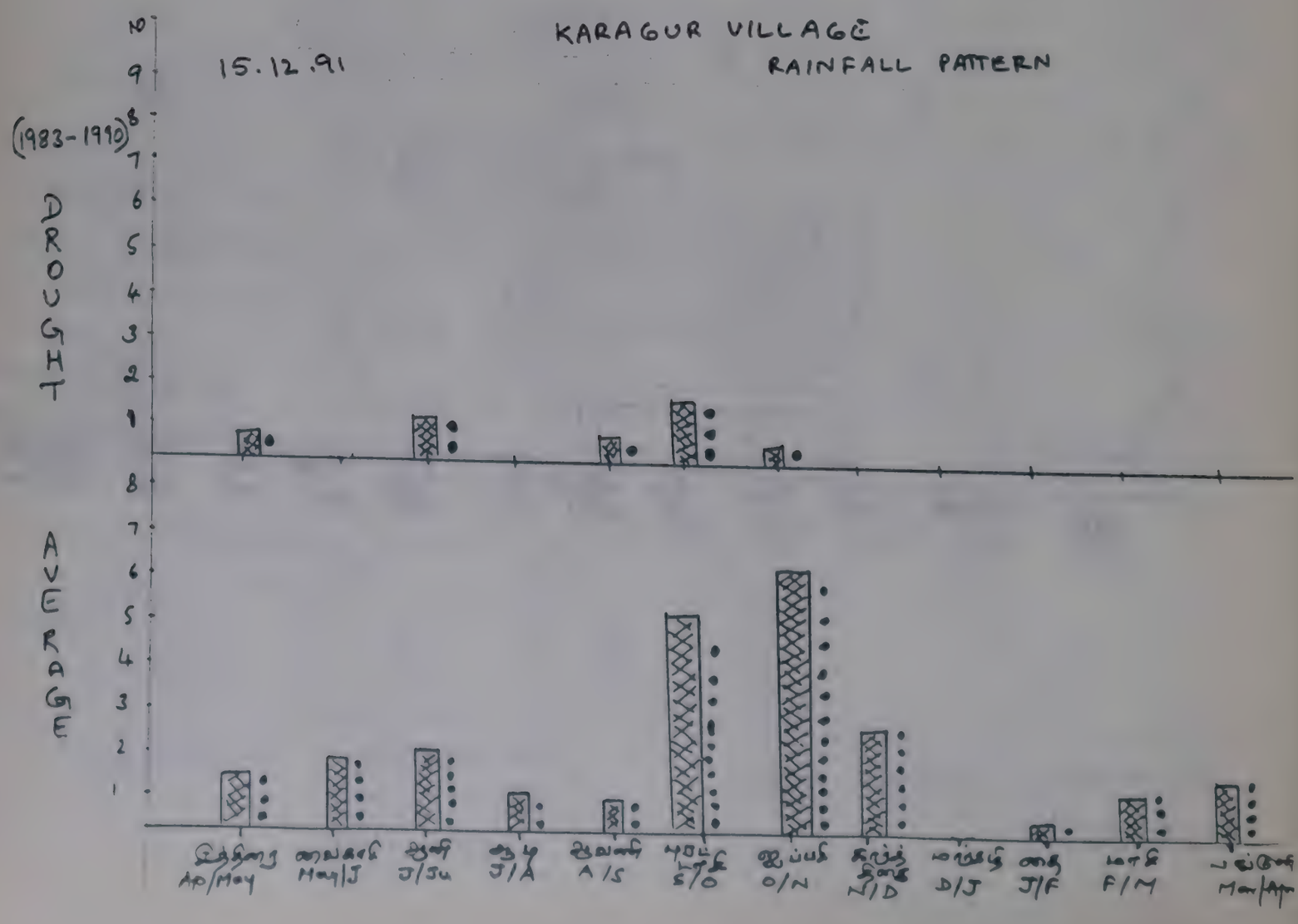
FIGURES 35



9. Seasonal Calendar: Rainfall Patten

The quantum of rain and number of rainy days over years were represented by the farmers by using sorghum straw and dots respectively. They produced a pattern for normal and for drought years. The monthly rainfall of the village was assessed and the number of rainy days was represented for all the months of the year. The seasonality of the rainfall was depicted by the farmer by placing the sorghum straw. The length of the straw was in proportion to the quantum of rainfall received. The probable number of rainy days was also mentioned by the informant and triangulated by another. A woman farmer denoted the same by placing white dots with rangoli powder adjacent to the sorghum straw. The group of informants were able to depict the quantum and number of rainy days during the drought years using the same materials at the bottom of the aforesaid markings. This analysis was carried out according to Tamil months starting from *Chitrai* to *Panguni* (April - May to March - April).

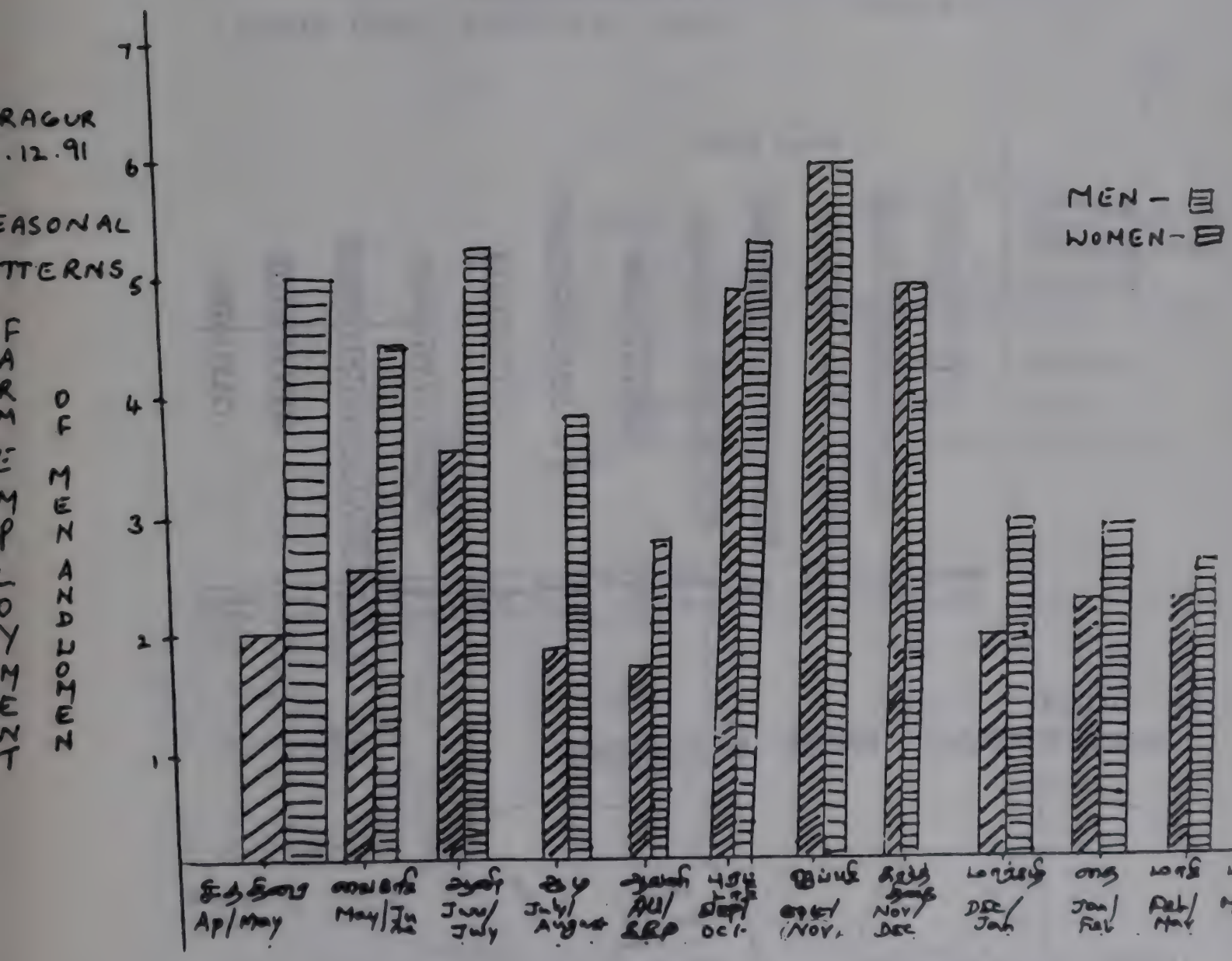
FIGURE 36



10. Seasonal Calendars: Labour, Income, Expenditure and Credit

The men and women labour utilisation pattern was revealed by the farmer respondent for all the months of the year. Using the same mode of mapping, men and women labour utilization was prepared by the farmers for every month. Separate bars were drawn for indicating men and women labour used in different months and it was differentiated by using colour powders by a farm woman. Seasonal income and expenditure patterns for all the twelve months were prepared in the same way by the farmers. Cropping pattern adopted in Karagur village was depicted through horizontal bars. By triangulation with another participant observer, cotton crop was fitted in the cropping system.

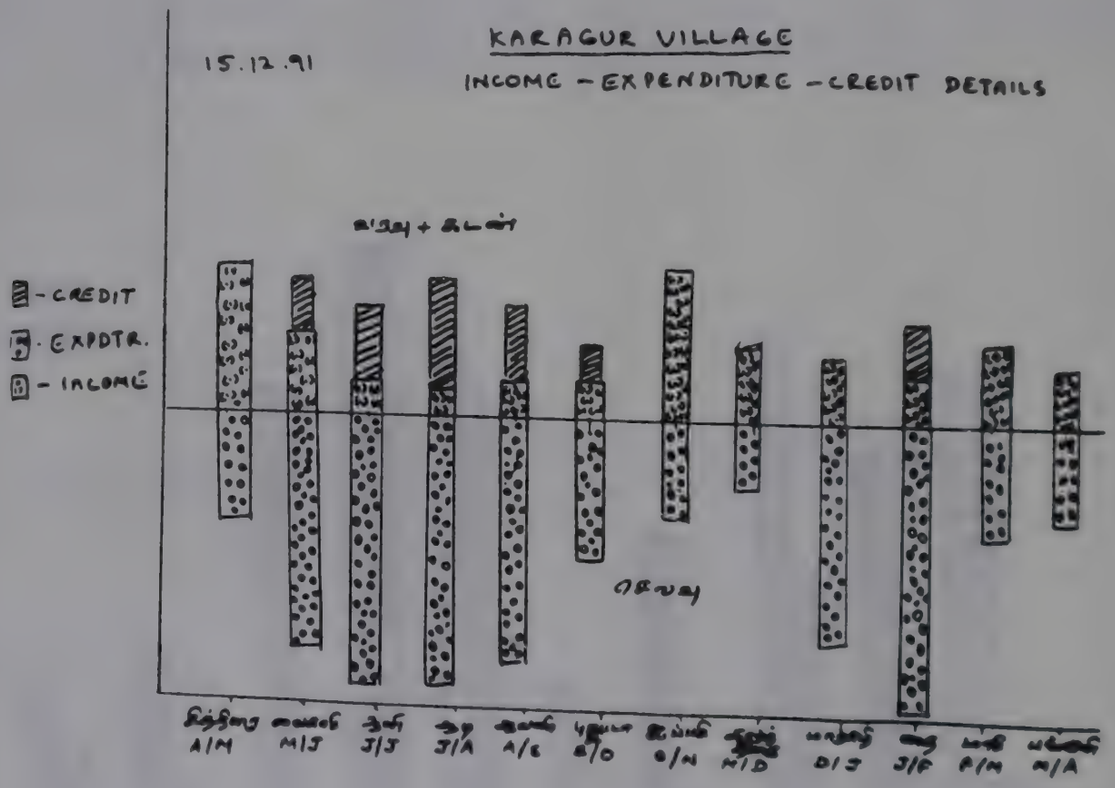
FIGURE 37

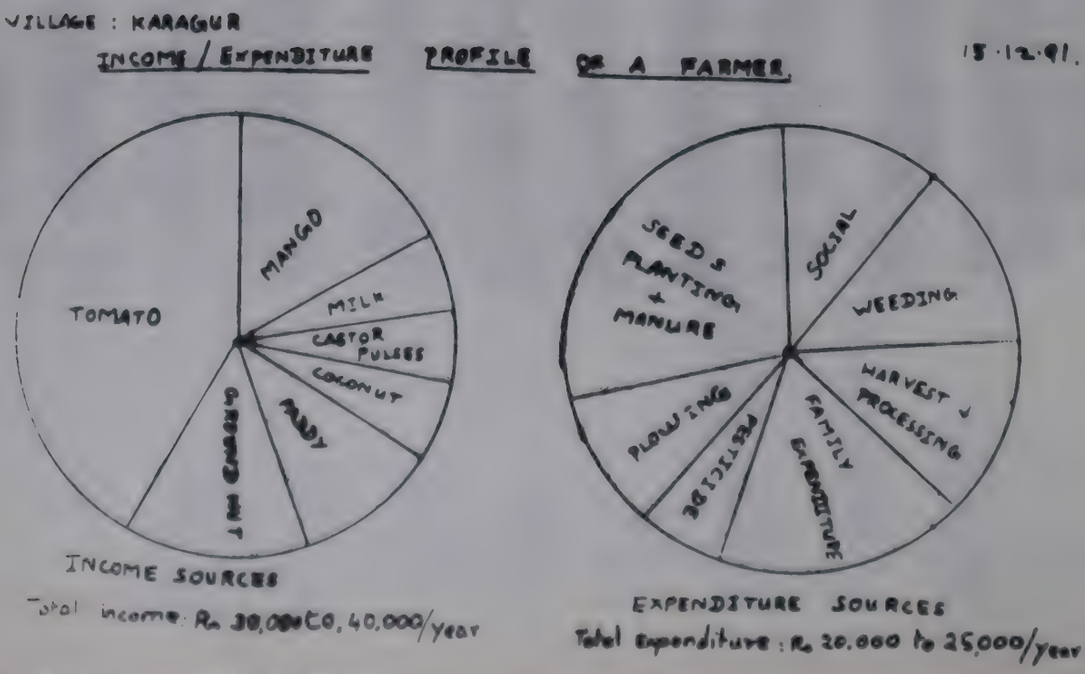


11. Income and Expenditure Patterns and Profile

The economic profile of the village was given by the farmers for all the months of the year following the aforesaid method. The annual income and expenditure pattern was provided by a farmer in relative terms. The income sources through different crops and livestock were presented by allocating proportionate sections through a pie-diagram. Similarly the expenditure sources denoting agricultural operations and social expenditure were also earmarked by him through the pie-diagram.

FIGURES 38, 39

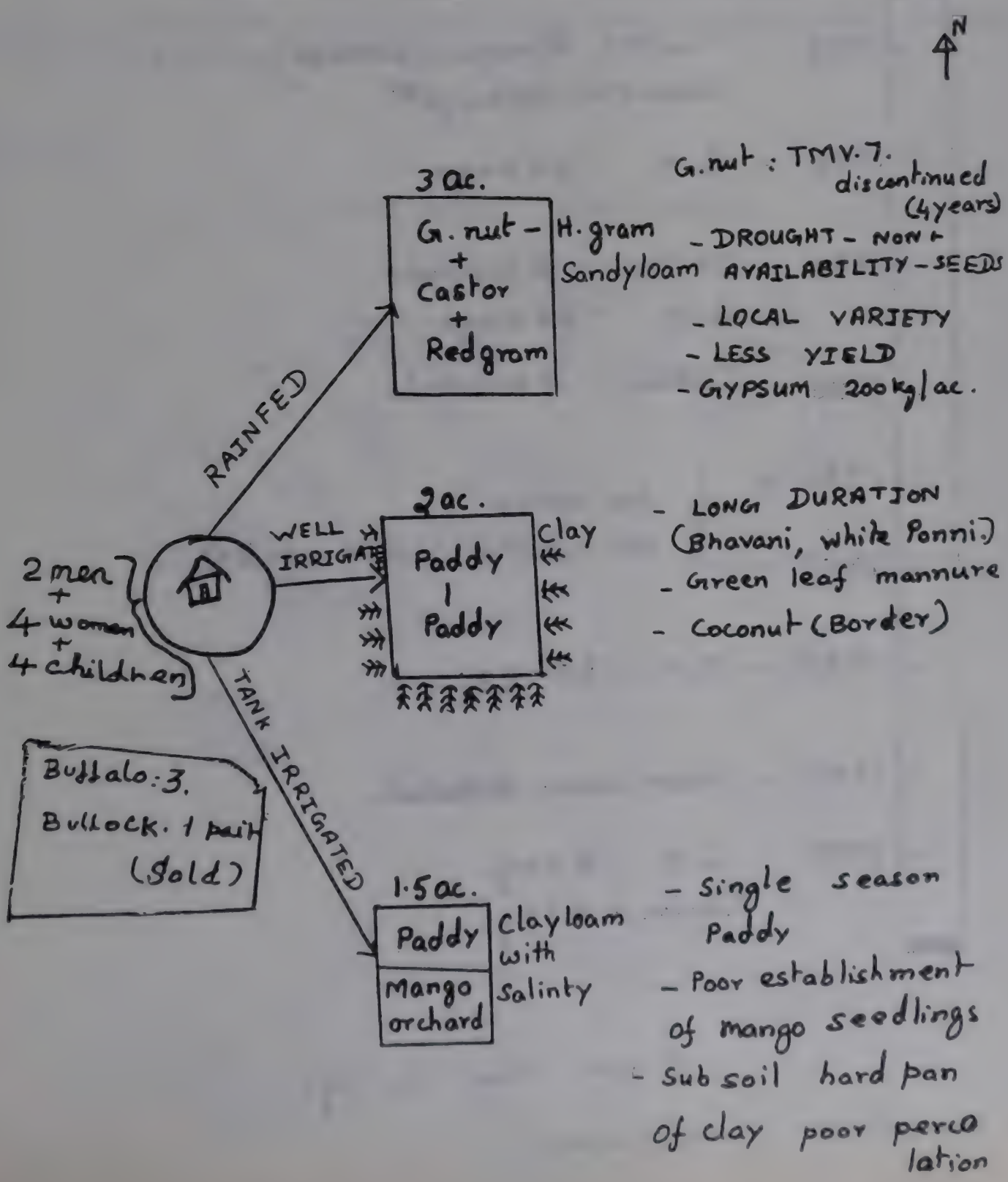




12. Farm Profile

By semi-structured interviewing of a farmer and the visualisation methods his farm profile was assessed. In this the farmer himself plotted all his land holdings showing the cropping sequences, irrigation sources, soil types, live-stock resources and the reasons for yield gaps. On the rainfed lands, he grew groundnut, castor and red gram and the main problems were drought and non-availability of seeds. On the well-irrigated lands, he grew bhavani and white ponni rice, and green manured with materials collected from common property lands. On the tank-irrigated lands, where he grew paddy and mango, the main problems were the poor establishment of the mango seedlings and the sub-soil hard pan.

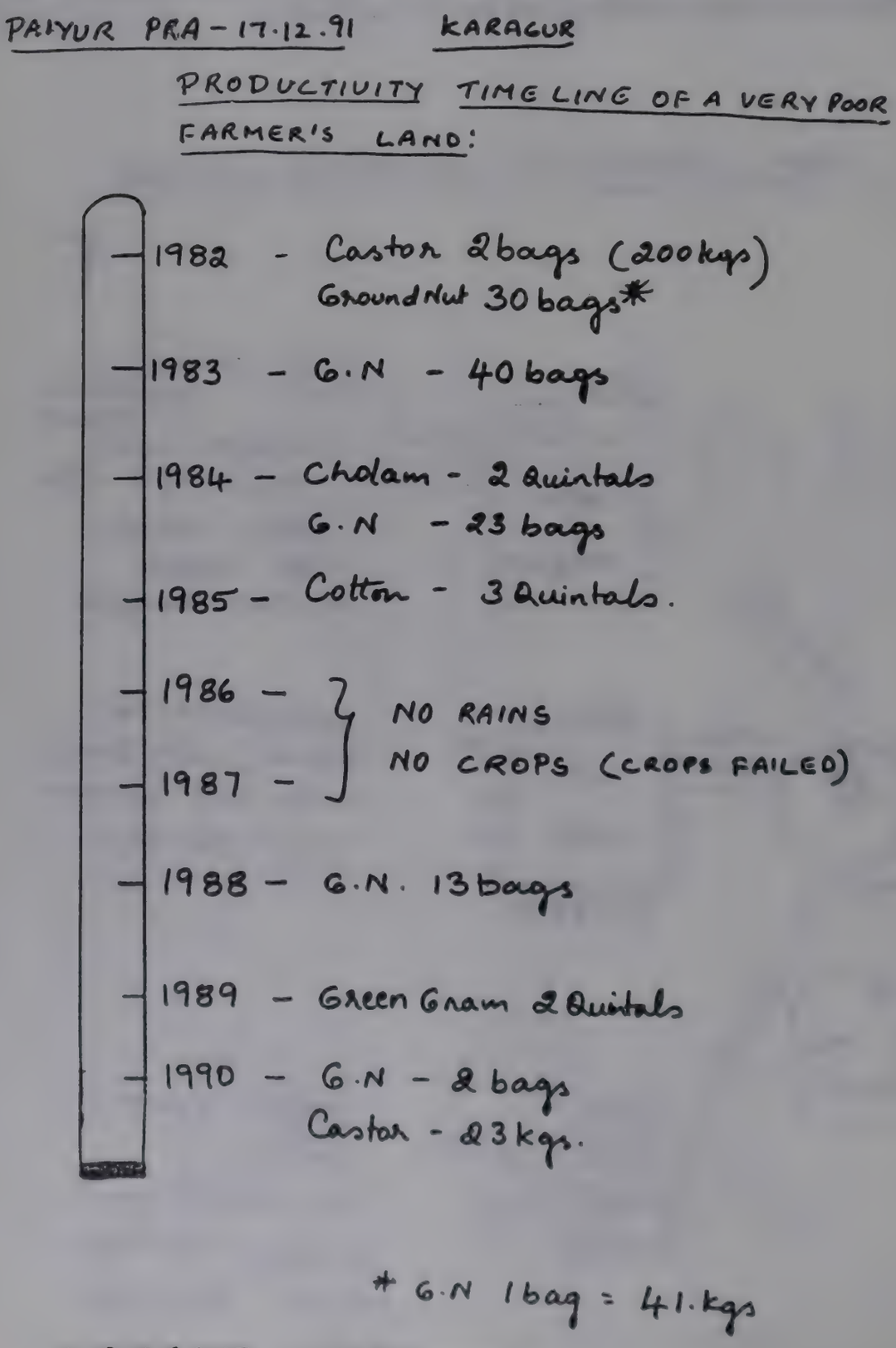
FIGURE 40



13. Productivity Time Line

As a technique to get the profile of a very poor farmer the productivity trends were analysed by semi structured interview. The productivity details were obtained for a period of ten years. This clearly illustrates the immense variability of year-to-year yields on the rainfed lands.

FIGURE 41


PAIYUR PRA - 17.12.91 KARAGUR
PRODUCTIVITY TIME LINE OF A VERY POOR FARMER'S LAND:
1982 - Castor 2 bags (200 kgs)
Ground Nut 30 bags*
1983 - G.N - 40 bags
1984 - Cholam - 2 Quintals
G.N - 23 bags
1985 - Cotton - 3 Quintals.
1986 -
1987 -
NO RAINS
NO CROPS (CROPS FAILED)
1988 - G.N. 13 bags
1989 - Green Gram 2 Quintals
1990 - G.N - 2 bags
Castor - 23 kgs.
* G.N 1 bag = 41. kgs
INFORMANT - NARAYANAN

14. Resource Flows and Nutrient Flows

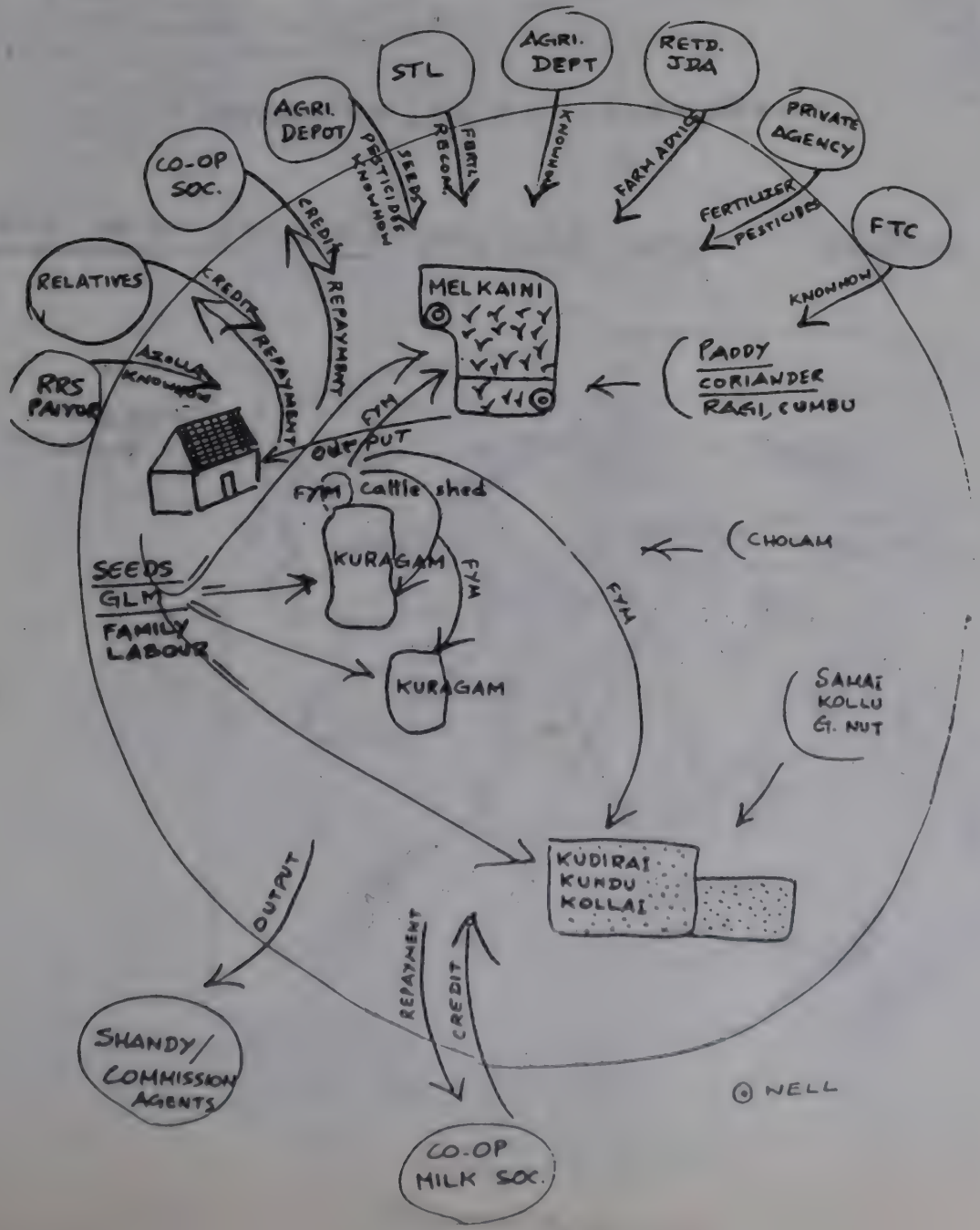
This exercise was performed for different categories of farmers such as rich, poor and very poor farmers. In the case of rich farmer separate mappings were made to indicate the resource flow and nutrient flow pattern. The farmer himself has located his household in the village map and again he could draw the farm holdings centring his house. He made indications for different inflows and outflows.

The resource flow of a poor farmer was represented indicating his accessibility to different institutions. While indicating the resource flow of a very poor farmer the PRA members triangulated and decided that actual visit to the land site is a must to get a clear picture. Two PRA members paid a visit the farm along with the farmer and triangulated with him. This provided rich information regarding the inflows, outflows of resources. It was inferred from this experience that the actual visit to the farm is required along with semi-structured interviewing to get more information on the resource flows of farmers.

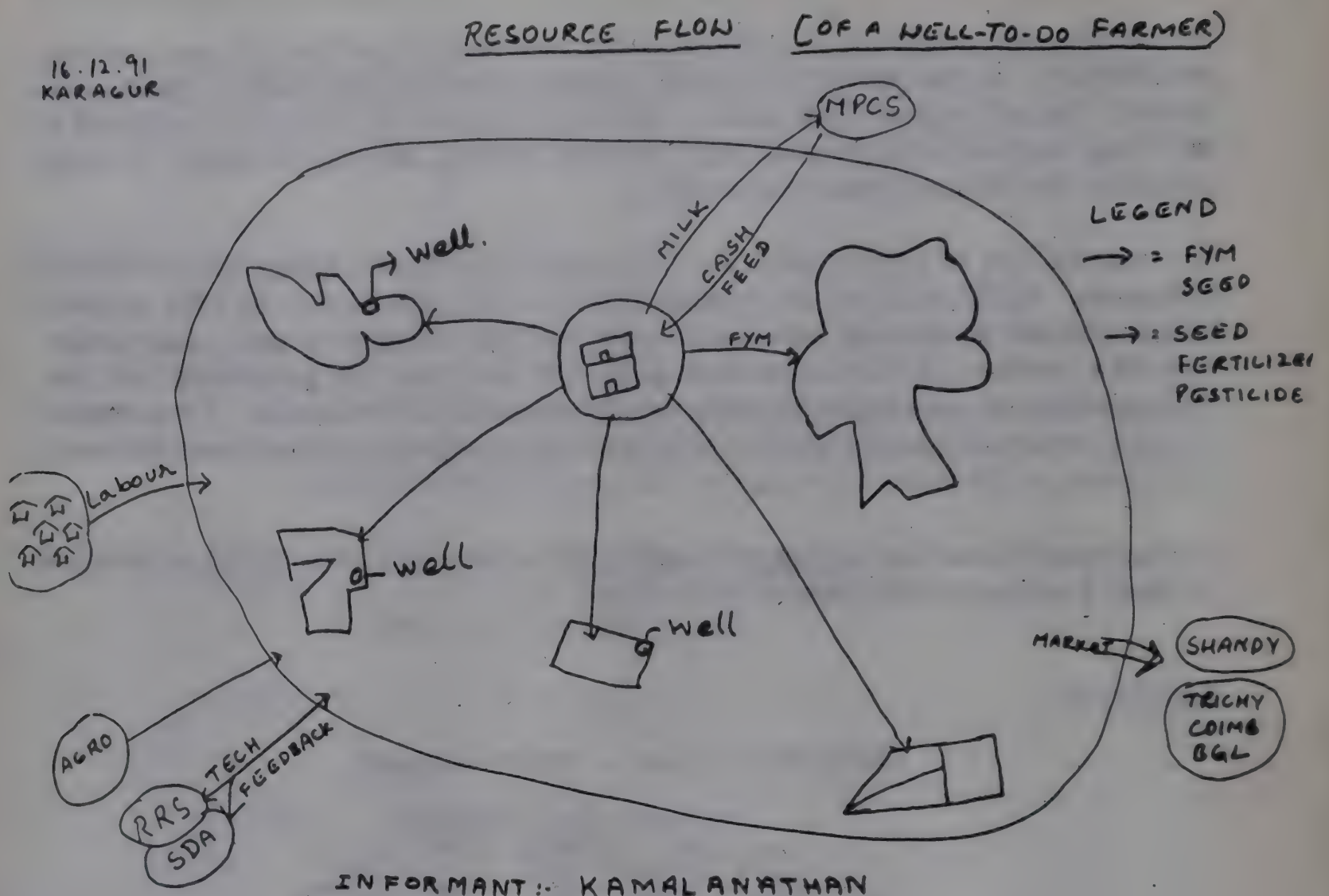
The very poor farmer has far fewer linkages with outside institutions, relying in particular on sheep penning to bring nutrients to the farm.

FIGURE 42

RESOURCE FLOW – POOR FARMER



FIGURES 43, 44



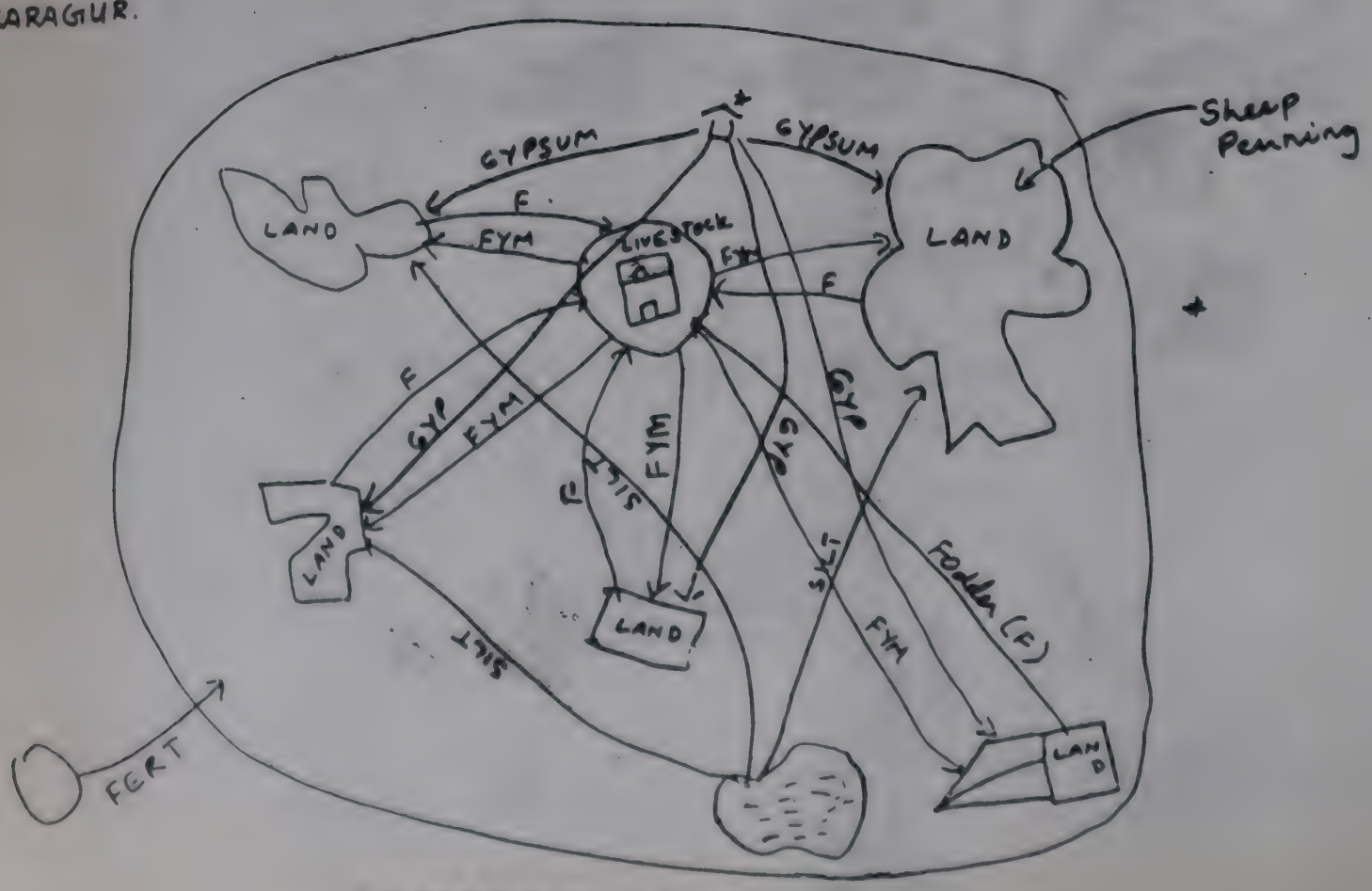
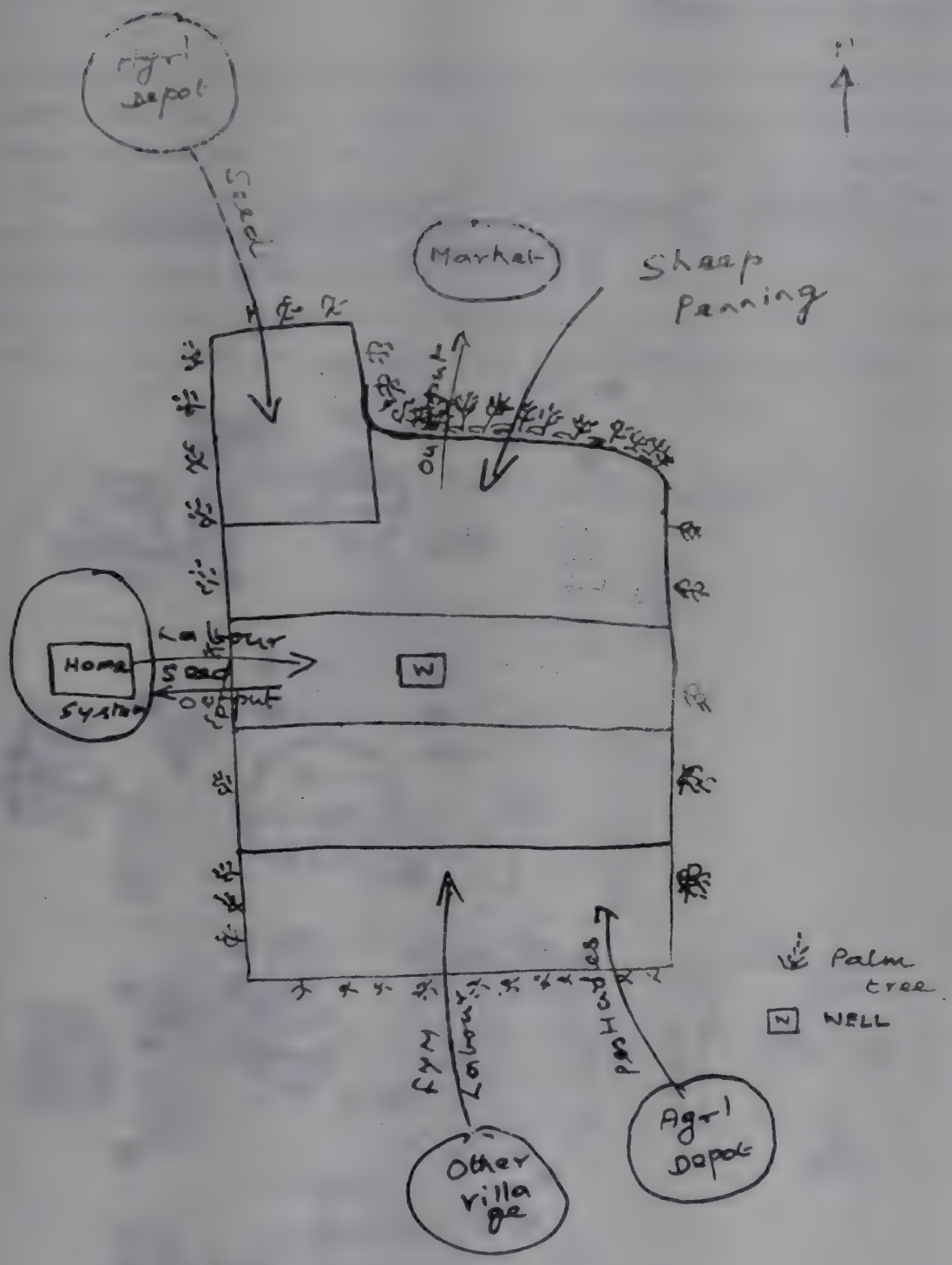


FIGURE 45

17.12.91

RESOURCE FLOW - VERY POOR FARMER



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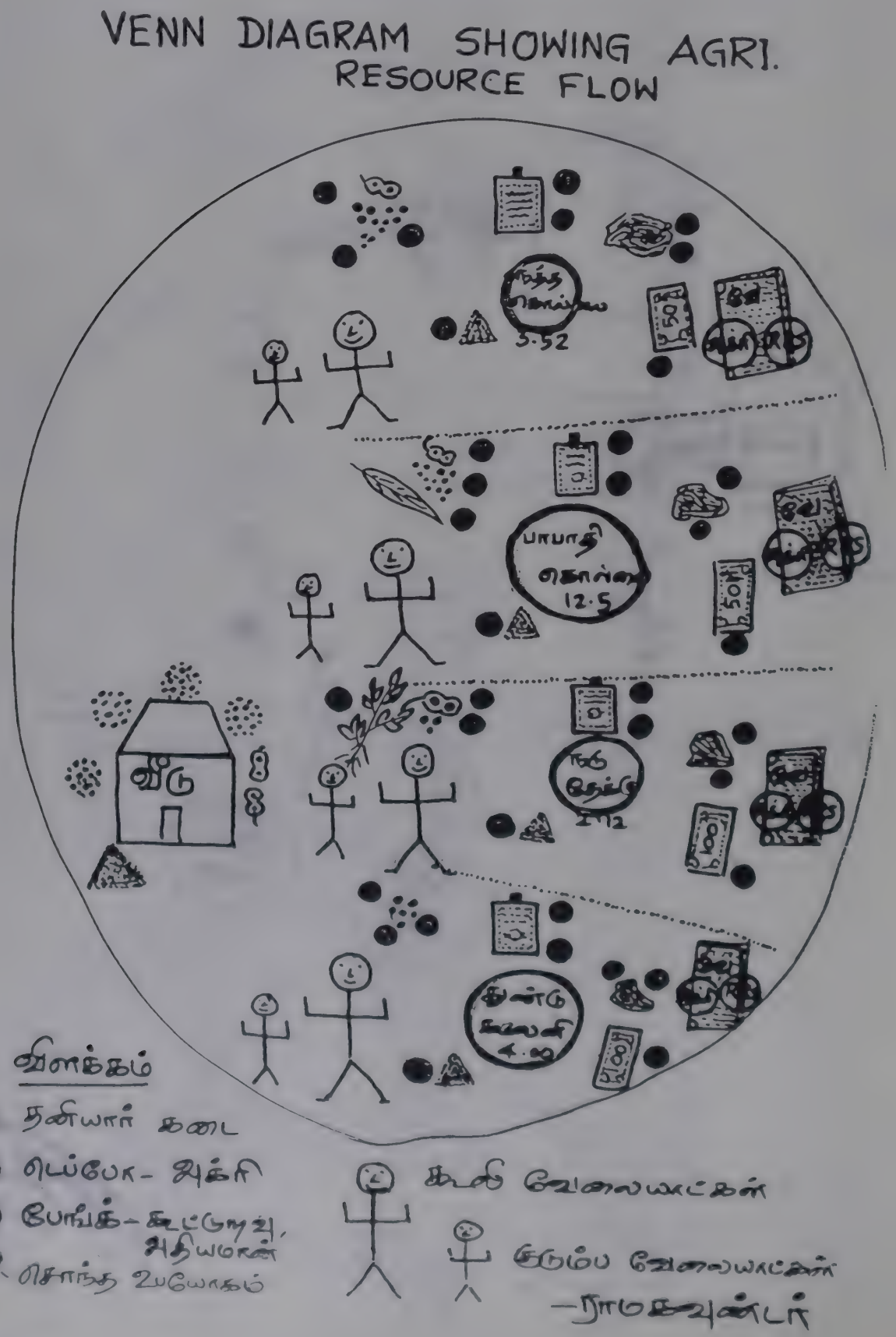
AND
DOCUMENTATION
UNIT
BANGALORE.

15. Venn Diagram and Resource Flows

Using a new combination of venn diagram and resource flow methods, the PRA team further explored interactions in the village. A key informant of the village indicated the sources of various inputs for his farming avocation by placing the actual inputs available with him. The input requirement and the sources of the inputs for different resource zones were earmarked by him. This exercise by the farmer altogether yielded a new methodology of combining the resource flow and venn diagram.

FIGURE 46



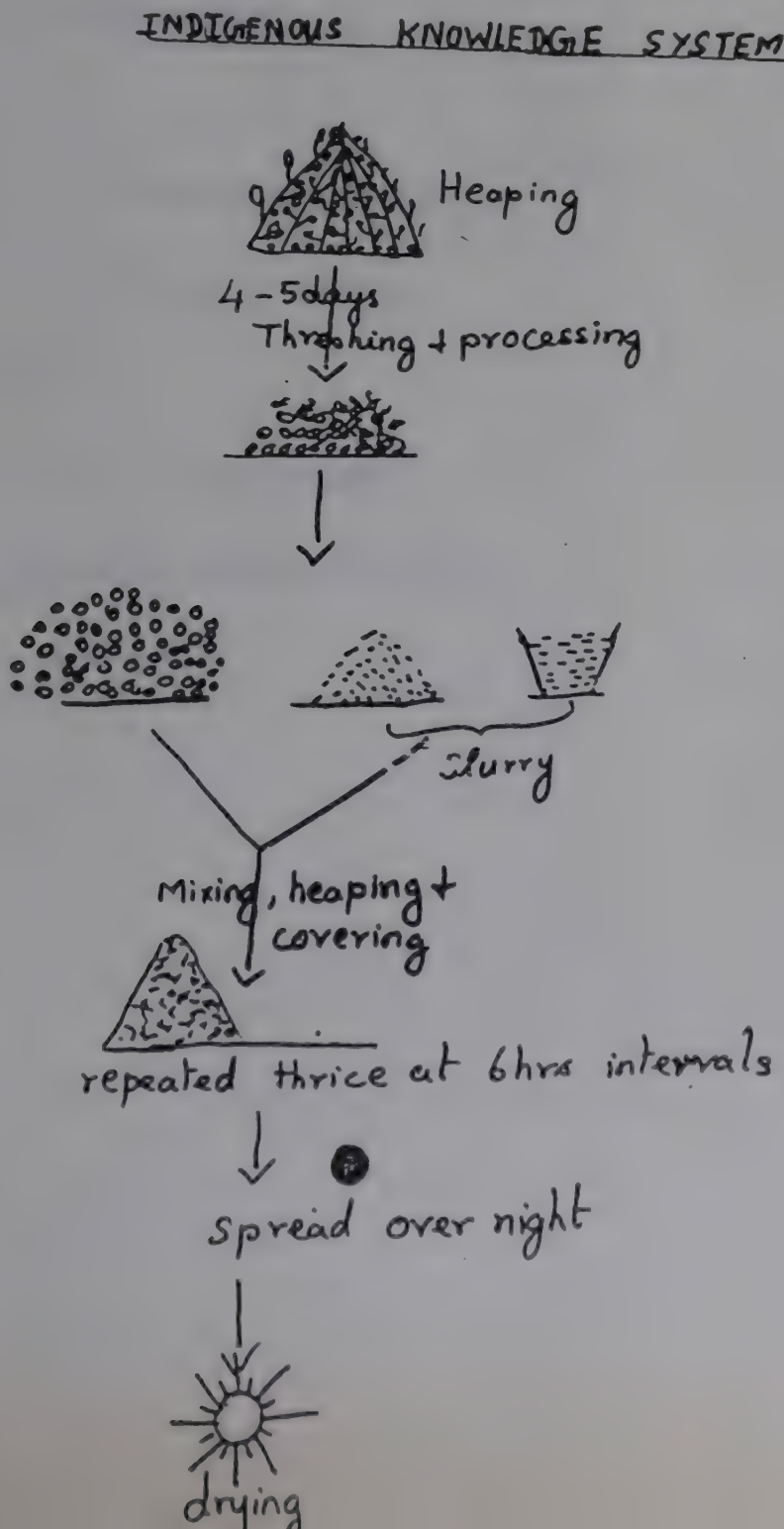
16. Indigenous Knowledge Systems and Local Innovations

In an effort to understand the local innovations of the farmers semi-structured interviews were made. It was interesting to note that they have indigenous practices on post-harvest technology for redgram and tomato ratooning.

1. Processing of Redgram

The harvested redgram grain (60 kg) is mixed with 15 kg of red earth slurry in the early hours and covered with gunny for six hours. Then it is smeared with red earth water again, heated and covered with gunny for another six hours. This process is repeated twice at six hours interval, heaped and covered with gunny over night. Next day it is dried throughout day and left exposed to dew overnight. By 4.00 p.m. the next day, the treated grains are collected and packed tightly in gunnies and retained as such for ten days, after which the produce is either sent to the mill or hulled manually. Red earth slurry is prepared on new moon day to ward off storage pests and for easy separation of the seed-coat.

FIGURE 47



2. Ratooning of Tomato

The farmers adopt an innovative system of ratooning in tomato which is a rare practice. The farmers said that tomato gives a better yield and acted as a better source of income than any other crops in their farming system. So they cared more about their tomato crops and were not prepared to leave the crop after the first harvest. They developed their own nutrient management practice for the tomato ratoon crop by applying N & K. Farmers felt that this practice assured continuous yield of tomato and provided better income during the lean periods. This experience of the farmers when probed further showed that there is a need to evolve a better tomato variety suitable for ratooning with improved management practices.

17. Key Problems

A range of short and long term problems were identified.

Short Term:

- Weeds in rainfed areas - hariyali, nut grass;
- Sub soil hard pan in wetlands;
- Seasonal labour scarcity;
- Waterlogging;
- Pests and diseases.

Long Term:

- Soil erosion in rainfed areas;
- Soil salinity;
- Non-dormancy in bunch-type groundnut;
- Weak pegs in bunch-type groundnut;
- Poor soil fertility;
- Low productivity of ratoon tomato;
- Procedural difficulties in obtaining credit;
- Unorganised community.

18. Sustainability Analysis

Sustainability analysis was used to analyse three different types of farming system, namely surplus, subsistence and deficit. The farmers' system, goals and objectives, output indicators and impact indicators were used to asses the strengths and weaknesses of the current system. This building on knowledge of local conditions led to the development of research, extension and policy responses required. These were divided into activities that should be continued, added or discontinued.

FIGURE 48

PRA. PAIYUR – 19.12.91 – KARAGUR.
SUSTAINABILITY ANALYSIS – 'SURPLUS' FARMING SYSTEM

FARMERS' SYSTEMS	GOALS/ OBJECTIVES	OUTPUT INDICATORS	IMPACT INDICATORS
1. Paddy, Pulses and Coconut 2. G.Nut + C.Pea H.Gram + G.Gram R.Gram + Fodder Cholam (GARDEN) 3. G.Nut + R.Gram + Castor + cowpea + cowpea + lablab Livestock (cows & draught animals)	Optimal productivity Efficient use of ground water Soil improvement Risk adjustments	Paddy yield Straw yield pulses grain yield crop residues Coconut yield fuel material G.nut cake as feed for cattle FYM milk yield	Better standard of living Asset creation Improved soil fertility Seeds for own use Management of stress Repayment of loans.

PRA - PAIYUR - 19.12.91 KARAGUR SUSTAINABILITY ANALYSIS
SURPLUS FARMING SYSTEM

EXISTING SYSTEM		RESEARCH / EXTENSION / POLICY RESPONSE		
STRENGTHS	WEAKNESSES	CONTINUE	ADD	DISCONTINUE
Access to technical information Soil erosion control measures Fertility improvement measures	Weed infestation. Subsoil hardpan and water logging in wet lands + salinity Peak season - labour scarcity Pod borer in pulses (R.Gram) leaf spot disease in coconut	Crop diversification (R) Drainage System (OFR) Transfer of saline soil mgmt tech (E) Pod borer mgmt tech and leaf spot disease mgmt tech for Coconut (E)	Weed mgmt (R) Tech. for mgmt of subsoil hard pan. (R) Improved labour saving implements (R) Development of saline resistant Paddy varieties (R) G.nut variety (R) With increased Peg strength (bunch) dormant (R) G.Nut (bunch) variety	— ADD Easy procedural means for (P) availing credit

FIGURE 49

PRA - PAIYUR - 19.12.91 . KARAGUR.

SUSTAINABILITY ANALYSIS

SUBSISTENCE CATEGORY.

Farmers' system activities	Goals & objectives	output indicators	Impact indicators
1) Paddy / coriander / Ragi / cumbu 2) cholam / Samai / G. nut / H. gram 3) Live stock (Cows only)	- Security - Soil erosion control - Soil improvement - Efficient utilisation of ground water	1) yield of Paddy / coriander, ragi, cumbu, cholam, samai, Gy. nut, H. gram 2) Straw yield of paddy, ragi, cumbu, cholam, samai 3) crop residues of G. nut and H. gram 4) milk yield 5) FYM 6) cattle power	1) Food sufficient for family requirement 2) Repayment of dues to milk Soc. 3) Improved soil & water utilisation 4) Storage of seeds for own use 5) Management of stresses

PRA - PAIYUR - 19.12.91 . KARAGUR.

SUSTAINABILITY ANALYSIS

SUBSISTENCE CATEGORY

Existing SYSTEM		RESEARCH / EXTENSION / POLICY RESPONSE		
STRENGTHS	WEAKNESSES	what should be continued	what new activity is to be started	what should be stopped
- Spreading risk - diversified cropping - improved soil fertility - Access to knowhow	- weeds - Pests & diseases .. Pod borer in red gram - Non. dormancy in G. nut - Salinity - credit insufficiency	- Diversification (R) - Drainage system (OFR) - Transfer of saline soil mgt. tech. (E) - Pod borer mgt. in red gram (E) - Diversified enterprises by inclusion of livestock components (OFR)	- weed mgt. (R) - mgt. tech for subsoil hard pan (R) - Improved labour saving implements (R) - Dev. of saline resistant varieties (R) - Dormant bunch G. nut varieties with increased peg strength (R) - Easy procedure for availing credit (P) - Drought mgt. strategies (OFR)	-

FIGURE 50

PRA - PAIYUR

19.12.91. KARAGUR.
SUSTAINABILITY ANALYSIS.
DEFICIT SYSTEM.

FARMERS' SYSTEMS ACTIVITIES	GOALS & OBJECTIVES	OUTPUT INDICATORS	IMPACT INDICATORS
G. NUT + CASTOR LAB LAB GREEN GRAM RED GRAM + CONPEA + H. GRAM — OFF-FARM EMPLOYMENT	SUBSISTENCE EMPLOYMENT GENERATION	YIELD OF G. NUT CASTOR, LAB LAB G. GRAM, R. GRAM CONPEA and CONPEA CROP RESIDUES OF G. NUT and OTHER PULSES FUEL - CASTOR AND RED GRAM STALKS FAMILY LABOUR UTILISATION	Irregular Food SUPPLY REDUCTION IN OFF-FARM EMPLOYMENT.

PRA - PAIYUR

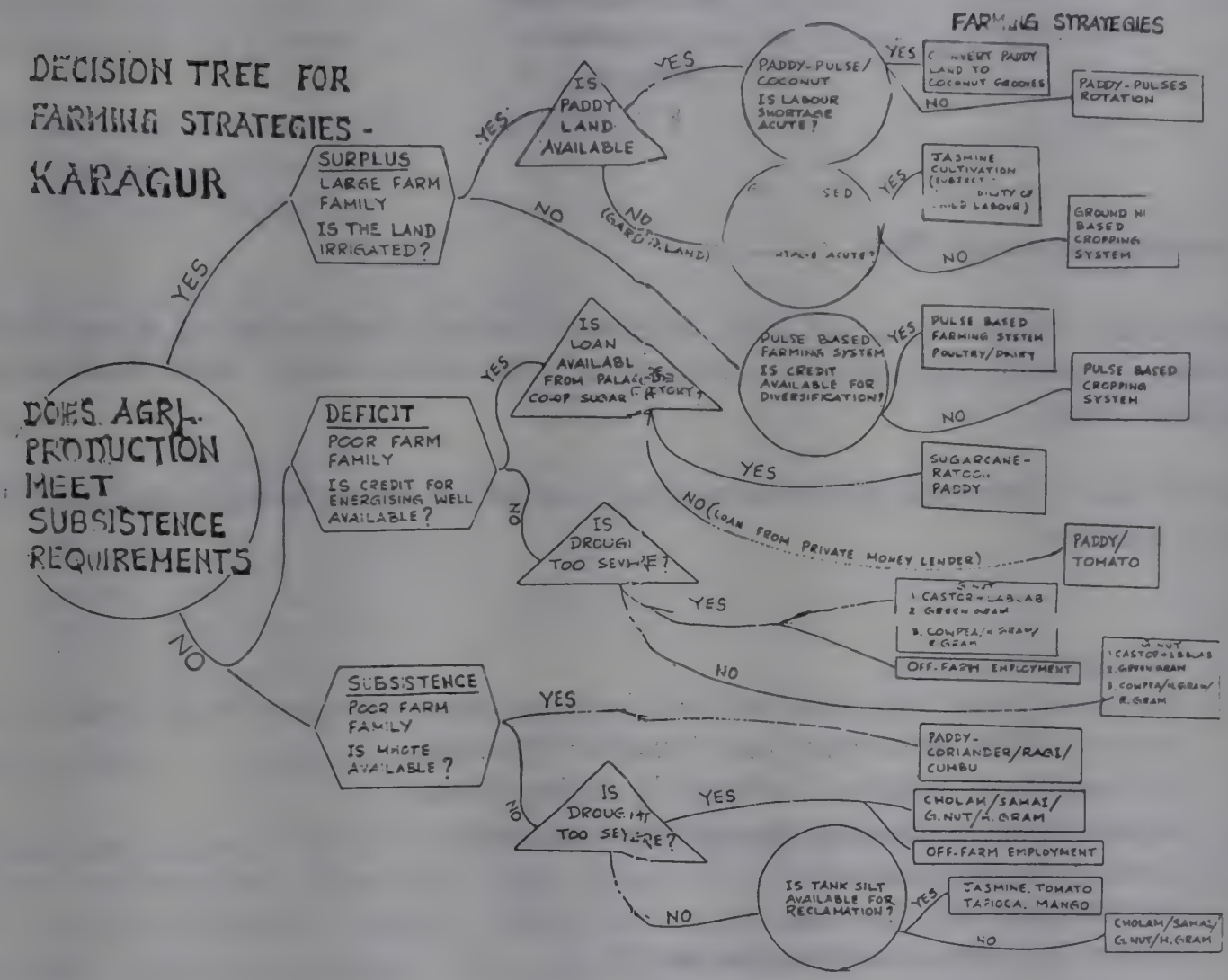
19.12.91. KARAGUR.
SUSTAINABILITY ANALYSIS
DEFICIT SYSTEM

EXISTING SYSTEM		RESEARCH / EXTENSION / POLICY RESPONSE		
STRENGTH	WEAKNESS	WHAT SH. BE CONTINUED	ADDED	DISCONTINUED
IMPROVING SOIL FERTILITY	WEED (HARIYALI NUTGRASS) POD BORER IN PULSES AND YELLOWING OF PULSES. LACK OF DIVERSIFIED ENTERPRISES LACK OF FINANCE VULNERABLE TO DROUGHT	DIVERSIFIED ENTERPRISES (R) (OFR) DRAINAGE MANAGEMENT TECHNIQUES (R) (OFR) SALINE SOIL MANAGEMENT (E) TECHNIQUES POD BORER MANAGEMENT (E) IN PULSES	WEED MANAGEMENT IN RAIN FED CONDITION (R) TECHNOLOGY DEVELOPMENT TO BREAK THE SUB SOIL HARD PAN (R) DEVELOPMENT OF SALINE RESISTENCE (R) VARIETIES DORMANT BUNCH GNUT (R) VARIETY G. NUT VARS WITH STRONG PEG (R) DROUGHT MANAGEMENT (R) TECHNIQUES EASY PROCEDURE FOR AVAILING (P) INSTL. CREDIT	LEGEND R - RESEARCH E - EXTENSION OFR - ON FARM RESEARCH P - POLICY

18. Decision Tree for Farming Systems

A further output from the sustainability analysis was the production of a decision tree to illustrate the option open to the different types of farming household in Karagur.

FIGURE 51



5. PRA OF KUMBARAHALLI VILLAGE IN DHARMAPURI DISTRICT

A Paliniswamy
M Shanmugam
A Palchamy
S Jeeva
Amala Das Devakirubai
V Natarajan
B Thiagarajan
A Kumar
Bernard J P
K C John

1. Introduction to the PRA

Kumbarahalli village is 12 km from Regional Research Station Paiyur along National Highway 7, running from Salem to Bangalore. The village comes under Karimungalam panchayat union.

The PRA team formulated the following group contract in the workshop using the Problem Solving exercise:

- *Be punctual always;*
- *Carry out group responsibilities and functions that are assigned by the group, if there is any problem in carrying out, it may be reported;*
- *If a member is talkative, interrupt by saying 'please';*
- *Always abide team spirit, go and come in groups;*
- *Learn from the villagers;*
- *Be flexible to any situation;*
- *Follow the normal customs and norms.*

Before starting to the village a preplan of the work to be done was drawn. The team decided to depict the physical and social features in village mapping and do the matrix scoring and transect walk.

2. Participatory Mappings with Men, Women and Children

The group reached Kumbarahalli on 14.12.91 by 11.00 am. On reaching the village the team was greeted by a farmer and the Agricultural Development Officer. For village mapping of physical features the group was divided into two and proceeded on two directions. As the team proceeded other farmers joined the visit to their fields. The team visited the farmers field which was a coconut plantation with no drainage. The farmers cleared the doubts raised by the team members during their walk. When the members reached the starting point, there were eight farmers with the team members. During the discussions with the farmers, the following data about the hamlet was collected.

Total land area under cultivation 300 acres
Wetland 100 acres
Dry land 200 acres

Total number of families 140 (Approx)
Population 1500 (Approx)

Animals
Cows 50 (Approx)
Buffaloes 100 (Approx)
Bullocks 100 (Approx)
Goats 1000 (Approx)
Sheep 500 (Approx)
Pigs 100 (Approx)

Middle school 1 ; Primary school 1

The team asked one of the farmers who was actively taking part in the discussion to come forward and draw the village map. He mapped the village in a general manner without giving much of specific details. Then the identification of the settlements of each community, marking of temples, wells, schools, panchayat buildings etc. were made. Later the school children got interested and started marking each of the houses. Each house was marked with a card, on which the name of the household was written.

Four of the PRA members talked with four women and explained the purpose of the study of the village to them. The information gathered from the women revealed that Paddy, Ragi, Tomato are the crops grown by them. For the past 3 years since they had no rain, no crop was cultivated. They had two milch animals yielding 30 litres per day and the milk is procured by the milk society. Though 4-5 women were present, they were not interested in involving themselves in mapping. A women was requested to do the mapping and she drew the houses. But she could not remember all the houses. An old man helped her and drew the important features of the village like Balwadi, Milk Society, Temple, wells and hand pumps, ration shop with different colours. Small children helped to collect stones to indicate houses. Once again cards were used for the naming of each household, to cross check the previous exercise. Since the women were not able to draw the boundary line, a farmer (Nattamai) drew it.

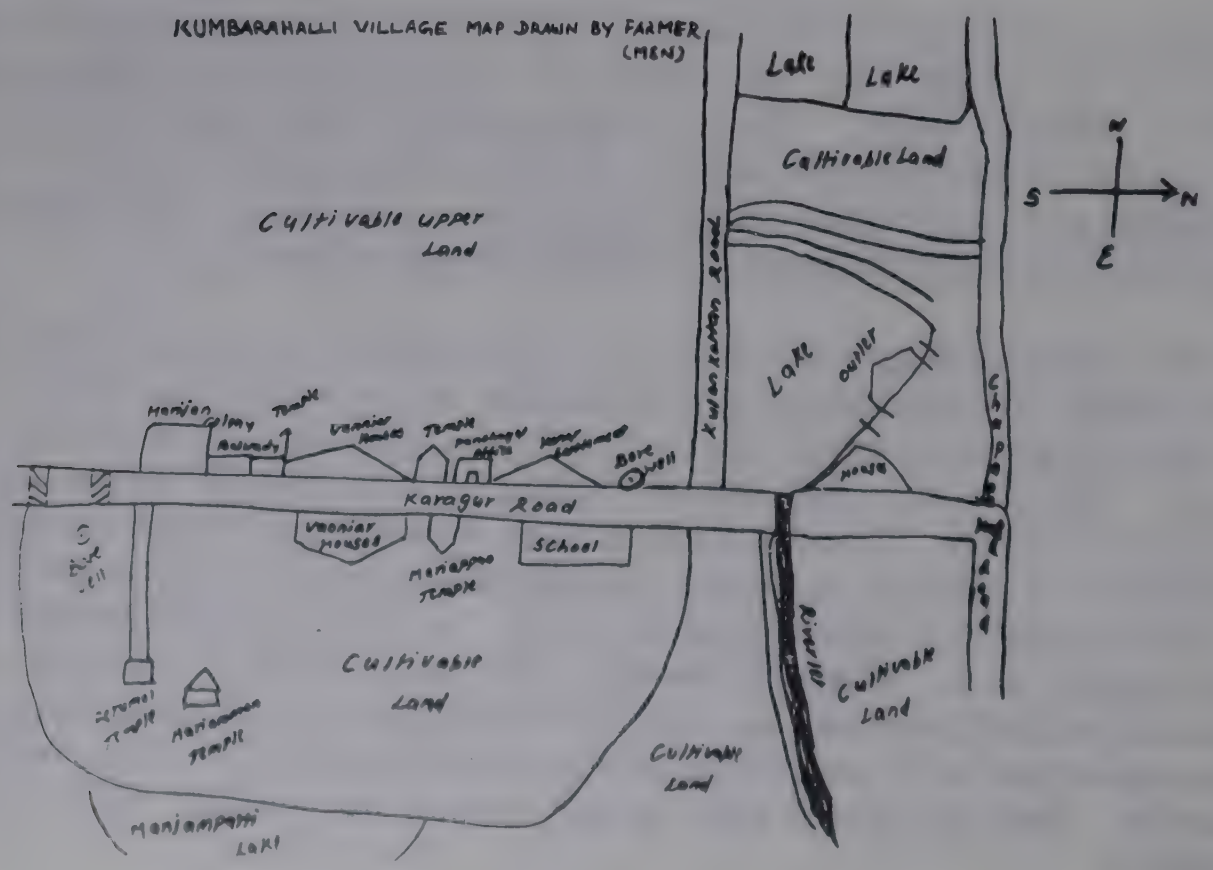
Communities	No.of families
Vanniyars	88
Scheduled Caste	21
Kurumbar	5
Carpenter	2
Konars	13
Chettiar	1
Total	130

Other amenities in the village

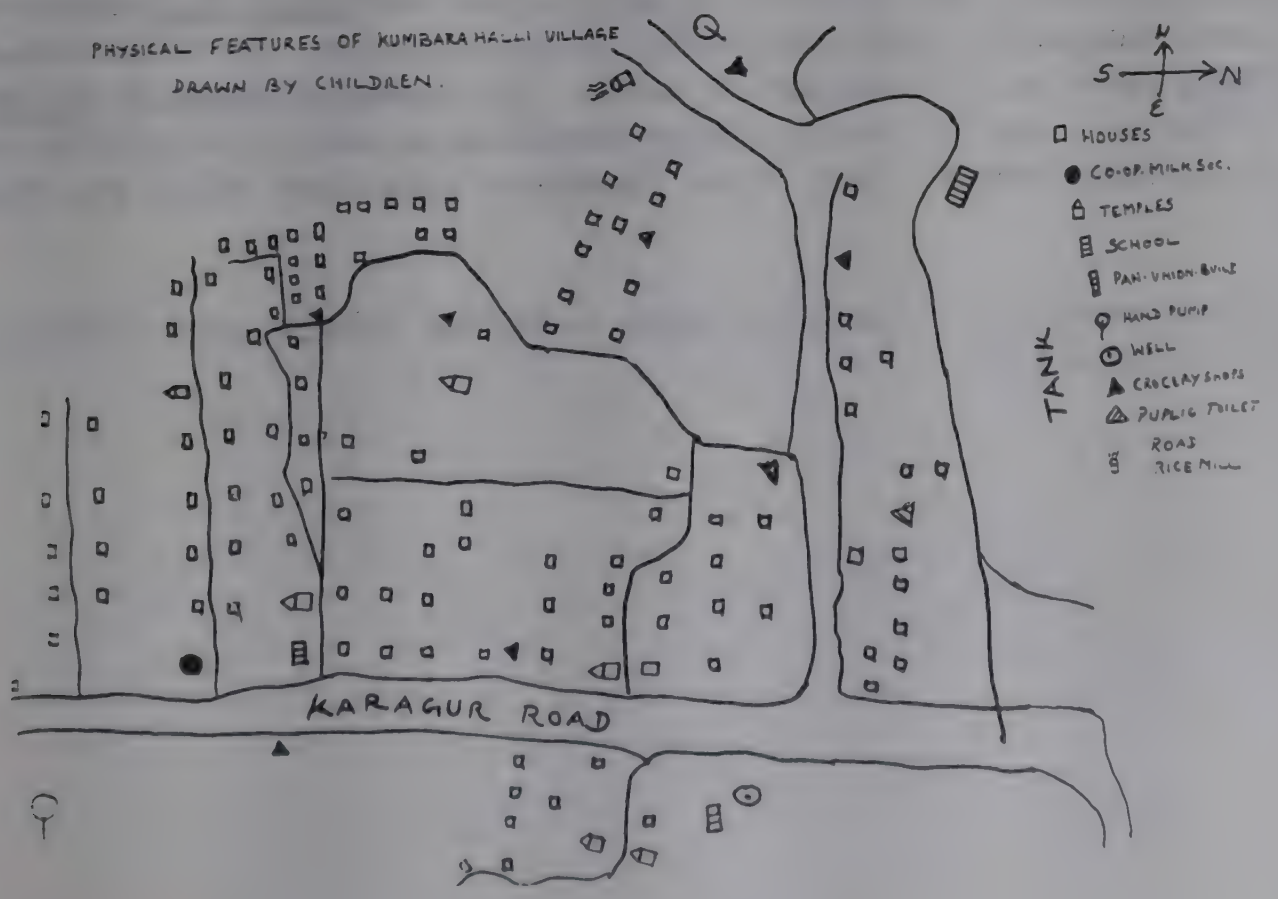
- Temples 5
- Schools 2
- Open wells 1
- Ration shop 1
- Panchayat building 2
- Bore wells 2
- Rice Mill 1
- Shops 6

The result of these mapping exercises was three different maps of Kumbarahalli village.

FIGURE 52



FIGURES 53, 54



3. Transect Walk

The transect walk of Kumbarahalli village offered an opportunity to explore the full spatial differences in the area of study. As the team walked, it explored the differences in land use, vegetation, soil type, crops, weeds, infrastructure trees, livestock, water resources, soil and water conservation measures as well as indigenous knowledge being applied. The team also observed the differences in topography of the area and other features.

The farmers described the agave plantations and small scale agave fibre extraction industry. The fibre extracted out of agave is being sent to Salem to be used in the manufacture of low quality silk saris and rope making. From the farmers statement one could observe that the villagers were able to classify the soils into different categories such as *manal kolli, Semman, Kollamedu, Pallam kuttakollai, Thoppu medu* etc.

The main crops grown under rainfed conditions under red soil, red sandy soil and rocky areas were horsegram, lab-lab, redgram, groundnuts, sorghum, castor, gingelly etc. Under irrigated conditions (well irrigated) the main crops were paddy,cotton, sugarcane, chillies, tomato besides horsegram, castor, lab lab and cowpea. The main soil type is red soil with little variations as sandy and loam types.

Several weed species were identified and they include cyperus, Hariali, Keelanelli, Punamullu, Thumbai, Pannai. A wide variety of tree species were reported by the farmers. They include trees like soapnut tree, mango, veppalai, tamarind, coconut, Iluppai, Thurinji, Palmyrah, Peenari, Neem, Seeta, Ben, Pungam, Vagai etc.

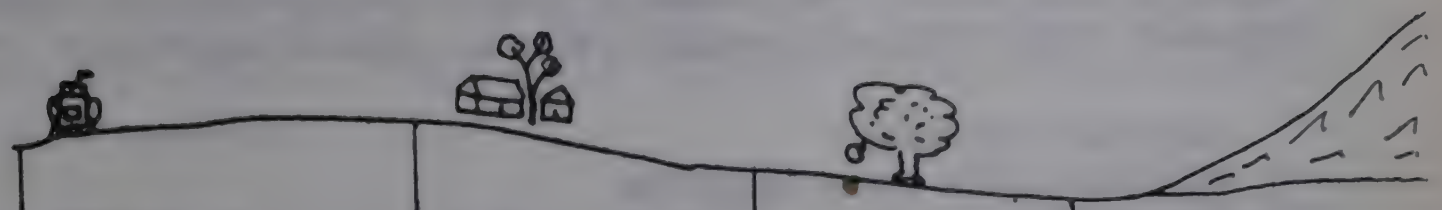
The main source of water is rainfall supplemented with well irrigation to certain extent. As a soil conservation measure, they are taking up agave (*Agave americana*) plantations which also serve as raw material for a small scale industry of fibre extraction. The refuse from this industry is being made use of as manure for paddy. One particular feature in the agave plantation is that it is used for fencing mango plantations as well as demarcating area belonging to different people. Such agave plantations were there inside the mango plantations.

Another point of knowledge of indigenous origin is that the villagers grow *Thattapairu (Pillipesara*) to serve as fodder.

FIGURE 55

TRANSECT WALK.

Kumbura halli



Name of the place	Kollamedu	pallam	kutta kollai	Thopu Medu.
Soil type	Manal kollai (Sandy)	Red Soil.	Red Soil.	Red Soil
Crops	Horse gram, Cowpea, Red-gram, groundnut, Sorghum Cotton, Ragi, pillipesara	Red gram, Salem, Cotton, Horse gram Sorghum + Lab-lab.	Lab-lab, Horse gram Gingelly	Horse gram, Cotton, Sugar-Cane, Lemon, Chillies, Cotton, pudding. Lab-lab. Cowpea.
Weeds	Hariyali, Cyperus, Kuda-malli, Thumbai, punemuthu	Similar weeds.	Similar weeds.	Similar weeds
Trees	Soapnut, mango, Neem, Alangi, Vepputi, Coconut Tamarind, palmera.	Albizia Amara, Ailan-thus, Neem, Custard-apple, Bassia latifolia,	Mango, Lemon and Ber, pongamia. Albizia lebbek,	Bassia latifolia, palmera, Ailanthus, Albizia Amara
Water resources	Rain fed.	Rain fed.	Rain fed	Rain fed + Well irrigation.
Soil & water conservation	Agave plantation	Bunding	-	
Indigenous knowledge	pillipesara as fodder.		-	agave for partition & fencing.

4. Matrix Scoring of Crops

The survey of the physical features of the village revealed that crops were grown under irrigated and rainfed conditions. Since the area under irrigated crop is very small, major rainfed crops like cotton, groundnut, sorghum, horsegram, cumbu and ragi were taken for matrix scoring. When the team explained the details of the method, Mr.Marappan and Mr.Gopal came forward. The criteria (all positive to ensure that large numbers of stones represents valued attributes) expressed by them for choice of crops were:

1. Least water requirement
2. Periodical income during crop period
3. Marketability
4. Net income
5. Less duration
6. Cost of cultivation
7. Benefit to ratio

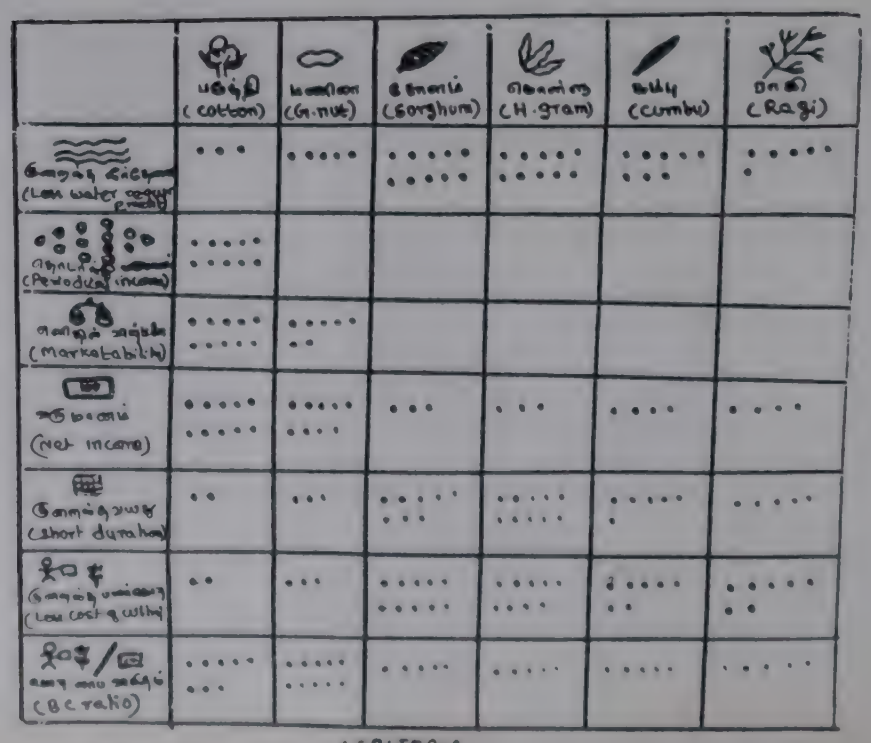
Since one participant was illiterate, the crops and criteria were represented with symbols. They used tamarind seeds to do the scoring procedure. Among the crops, they consider cotton and groundnut as commercial crops and sorghum, horsegram, cumbu and ragi as food crops. They like cotton because they get periodical income during the crop period, unlike other crops. The cost of cultivation of both cotton and groundnut is high. The matrix scoring expressed the need for evolving short duration varieties in cotton and groundnut, and to find out methods to reduce the cost of cultivation of these two crops.

FIGURE 56

MATRIX RANKING OF RAINFED CROPS

IN KUMBARAHALLI VILLAGE, DHARMAPURI DT.

TAMILNADU.



SYMBOLS FOR CRITERIA & CROPS WERE USED BY ILLITERATE FARMERS

TAMARIND SEEDS WERE used for scoring.

5. Matrix Scoring of Trees

A discussion was held on what are the PRA methods to be adopted in order to discover local attitudes and perceptions of the farmers. The group took up the topic of tree growing for matrix scoring. After explaining the method and how it should be done, the farmers were asked to list out the major trees grown in the village and also the various criteria based on which they were being cultivated. The major trees grown in the village were mango, coconut, tamarind and pungam. The other trees which were grown in the households were moringa, neem, papaya etc.

While one was doing the scoring, the other collected leaf specimen of the trees to be placed in the matrix and the third drew the matrix on the ground using rangoli powders. The nine criteria given by the farmers were drought resistance, suitability to soil, net returns, labour availability, least duration, least cost of cultivation, market availability, advance income and size of holding. But this last criterion, size of holding, was later discarded by the farmers.

The drought resistance was the foremost criterion in choosing tree followed by soil suitability and net returns. Another major aspect in the tree growing was that the farmers could realise the full income in advance from the contractors. The labour is scarce because of migration of people to Bangalore, where better employment opportunities are available. Mango was ranked to be the most preferred tree, particularly Bangalora and Neelum varieties. Coconut is susceptible to drought, and so is least liked.

FIGURE 57

MATRIX SCORING OF TREES

IN KUMBARAHALLI VILLAGE. DHARMAPURI DT.
TAMIL NADU.

TREES / CRITERIA	Tamarind	Pungam	Coconut	Mango
DRAUGHT REGISTANCE	○○○○○ ○○	○○○○	○	○○○○○ ○○○○○
SOIL SUITABILITY	○○○○○ ○○○○○	○○	○○○○○ ○○○○○	○○○○○ ○○○○○
NET RETURN	○○○○○ ○	○	○○○○○ ○○	○○○○○ ○○○○○
LABOUR AVAILBILITY (less labour required)	○○○	○○○○○ ○○○○○	○○○○○ ○	○○○○○ ○
LESS DURATION	○○○○○ ○	○○○○	○○○○○ ○	○○○○○ ○○○○○
LESS COST OF CULTIVATION	○○○○○ ○○	○○○○○	○○	○○○○○ ○○○○○
MARKET AVAILABILITY	○○○○○	○○○○○ ○○○○	○○○○○ ○○○○○	○○○○○ ○○○○○
ADVANCE INCOME	○○○		○○○○	○○○○

NAME OF INFORMANTS 1 CHELLAN
2 MURUGAN

SYMBOLS FOR TREES SELECTED BY THE FARMER
STONES WERE USED FOR RANKING.

6. Wealth Ranking

The entire process started with the discussion with farmers as to how their village could be divided. The first classification preferred was based on caste. The next classification preferred was based on the occupation of the villagers. The third one was based on the type of houses owned or lived in. The last classification took a lot of time as they had to discuss the factors to be taken into consideration for categorising the farmers according to their material possessions. After discussion, it was concluded that owning a TVS 50, a house of their own and 2 acres of land could constitute a farmer as wealthy. The farmers with own house and land of less than 2 acres were classified as medium class farmers and farmers with no land, and no house and farmers with only house but not land of their own and have to earn their livelihood by doing casual labour as poor farmer.

Classification based on wealth:

- Rich 11 households
- Middle 34 households
- Poor 84 households

Classification based on occupation:

- Large farmer > 2 acres 3 households
- Small farmers < 2 acres 80 "
- Business 8 "
- Government servants 7 "
- Agricultural labourers 31 "

Classification based on type of houses:

- Thatched 69
- Tiled 57
- Terraced 3

7. Historical Transect

An historical transect was carried out with one old farmer who was asked to recollect and inform about the village resources from 1970. A matrix ranking was done by him. Coins were used for this purpose since he could not understand and rank properly. He ranked with leaves but it was later evaluated with coins using one rupee coin as the base. The key findings were:

- Irrigated area has also increased considerably over the past 20 years.
- Forestry has been very much reduced indicating deforestation to a great extent.
- Fruit trees have increased recently.
- Wasteland has been reduced.

FIGURE 58

Criteria / period.	Rainfed Agriculture	Irrigated (Tank + well)	Forestry	Orchards.	waste - land -
1970.	25 paise	15	50	5	25
1980.	35..	25	25	25	15
1990.	90..	50	10	75	5

8. Historical Time Line

A semi structured interview with a farmer Mr.Munusamy, aged 57, as a case study on the historical time line was conducted. He could recollect some events and time with reference to some significant events.

1944	When he was 10 years old, the Annasagram lake break took place due to heavy rains.
1951	40 years back, there was severe drought and people resorted to eating of agave pseudo-stem.
1954	37 years back, there was widespread smallpox.
1961	30 years back, there was an outbreak of Cholera and many people died of it.
1966	25 years back, the school came into being in the village.
1971	20 years back there was an outbreak of insect red caterpillar in groundnut and aerial spraying was also done. Similarly in paddy *yaanai komban* outbreak was seen.
1981	10 years back, the Post Office was opened.
1981	10 years back, there was an out break of disease in cattle resulting heavy loss of cattle. The disease was called *Sappai Novu*.
1983	8 years back, there was a peculiar disease outbreak in goats in which the goats suddenly jumped, fell down and died. This was called as *Thullu Novu*.

9. Time Line by Women

An old woman of 60 years of age was able to give some information and development of her village with reference to some significant events. She was helped by other women in the group like noon meal scheme teacher, ayah magalir mandram leader.

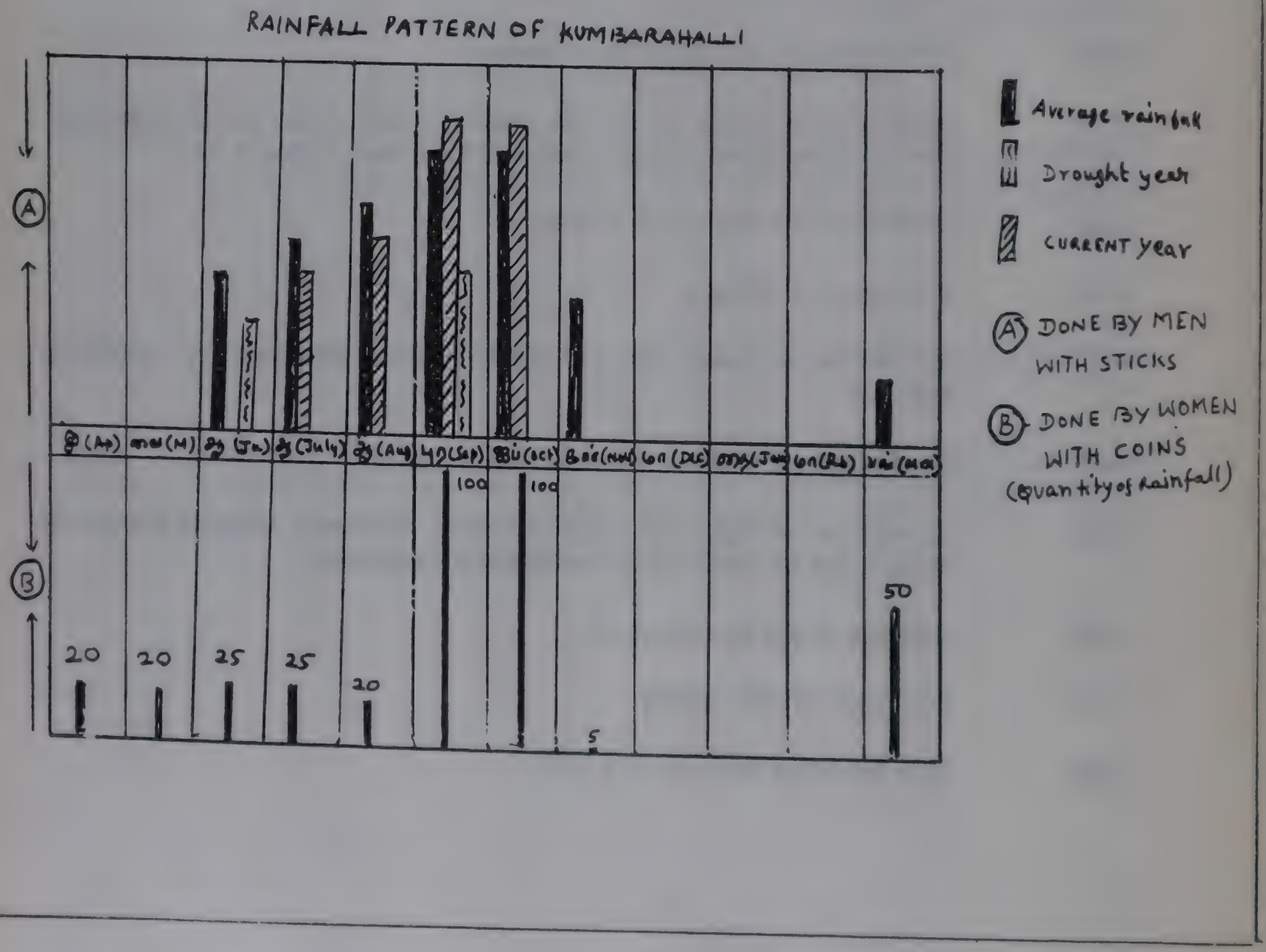
The time line by woman revealed that they could remember events which they gave importance and those events which were related to their day-to-day activities.

1955	Outbreak of cholera.
1961	Formation of magalir mandram.
1971	Formation of Panchayat.
1972	Introduction of oil engine for irrigation
1975	Introduction of ration system. The usual food habit is that of ragi based food. Due to ration system, Rice, Wheat and Rava were included later.
1982	Introduction of Noon meal scheme.
1983	Prevalence of drought.
1984	Introduction of health care and family planning measures and community radio set.
1985	Upgradation of primary school as middle school.
1988	Introduction of Tapioca in cropping system. Improved varieties through the introduction of Agricultural Development Programme.
1989	Addition of egg in noon meal.
1990	Formation of milk society.
1991	New panchayat and new rice mill.

10. Seasonal Calendar: Rainfall Distribution

The rainfall bar chart indicates the monthwise distribution of average rainfall, current year rainfall, and the previous drought year. The distribution of rainfall was done by men with sticks, whereas the quantity of rain received was indicated by woman with coins. This village receives rain for seven months. Maximum rain is recorded in September and October. The current year exceeds the average rainfall. The previous year was a drought year. The farmers estimated the rainfall quantity by the volume of rain water that was collected in the pounding stone and also by the condition that facilitates the work by country plough.

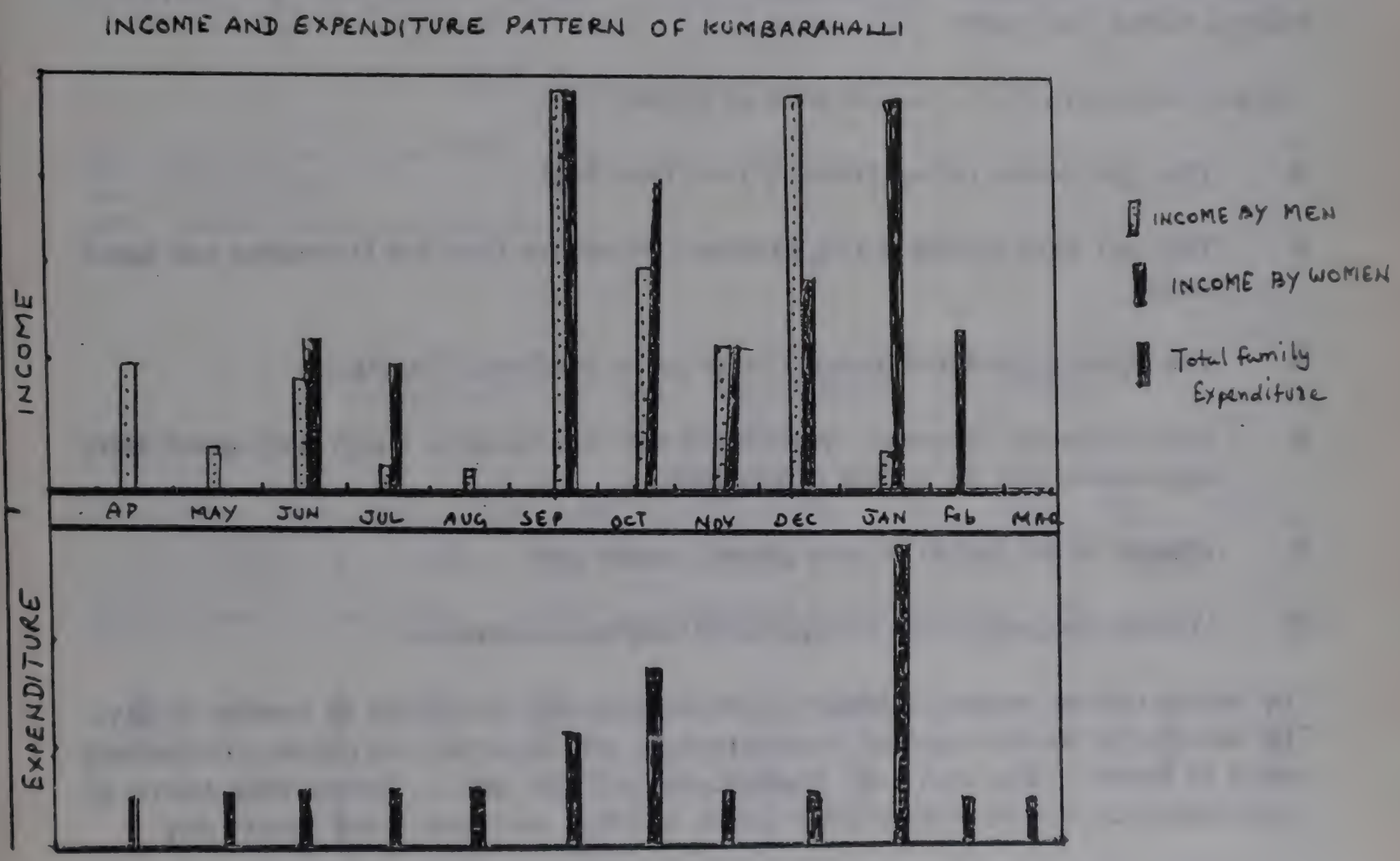
FIGURE 59



11. Seasonal Calendar: Income and Expenditure Pattern

The income and expenditure pattern was depicted by using coins. The income of men and women is same and high in the month of September that coincides with sowing season. The income of men is more in December because of field preparations. The women get higher income in January as it is harvesting period. Men get income almost in all the months whereas women get it when there are agricultural operations. With regard to expenditure it is high in January and October that relate to the festival months of *Pongal* (Harvest Festival) and *Dewali* respectively.

FIGURE 60



12. Seasonal Calendar: Income, Expenditure and Employment

A seasonal calendar of income and expenditure was done using cholam straw to denote income and dry sticks to denote expenditure. They represented the first month *Chitrai* with a full moon figure, as they celebrate the full moon day as *Chitra Pournami*. Since Vaihasi is the month with more marriages, they represented it with a figure of boy and a girl with locked hand. The *Ani* month was represented by a screw known as *Ani*. In *Adi* month they have Adi pandigai to worship god and so it was represented by flowers and *Avani* month was represented with paddy seedlings as transplanting was done during the month. *Puratasi* was marked with a religious symbol as they worship Lord Perumal in that month. The *Ipasi* month was marked with a cracker, as they celebrate Dewali during the month, *Karthegai* with cotton wick as they celebrate Deepam festival, *Margazhi* with pumpkin flower, as they use it to keep in front of their house during the month; *Thai* with sugarcane bagasse as they harvest sugarcane during Pongal festival; *Masi* with lab-lab pods as there are some pulses to celebrate Amman puja; and Kavadi symbol to denote *Panguni* month as they worship Lord Muruga during that month.

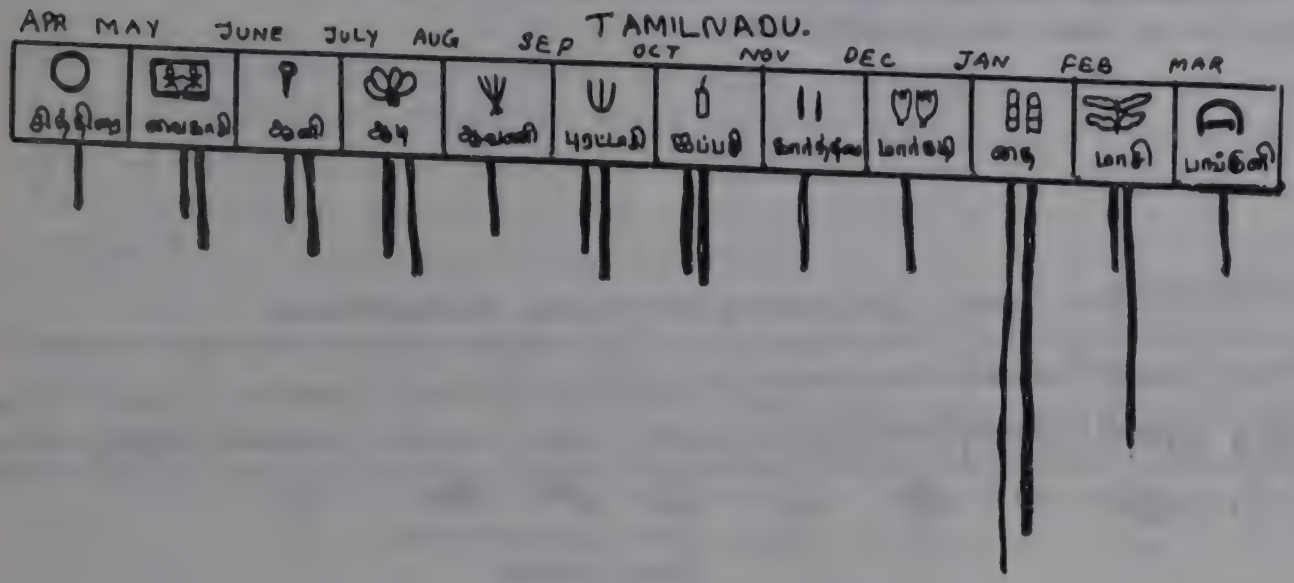
The key findings from the exercise were as follows:

- They get income during February from their Ragi.
- They get some income during October - November from the Groundnut and samai crops.
- The higher expenditure during Thai is due to the Pongal Pandigai.
- For celebrating Deepavali (November) and Adi pandigai (July) they spend extra expenditure over the regular expenditure.
- Drought in the past 8-10 years played a major role.
- Women gave very much importance to religious ceremonies.

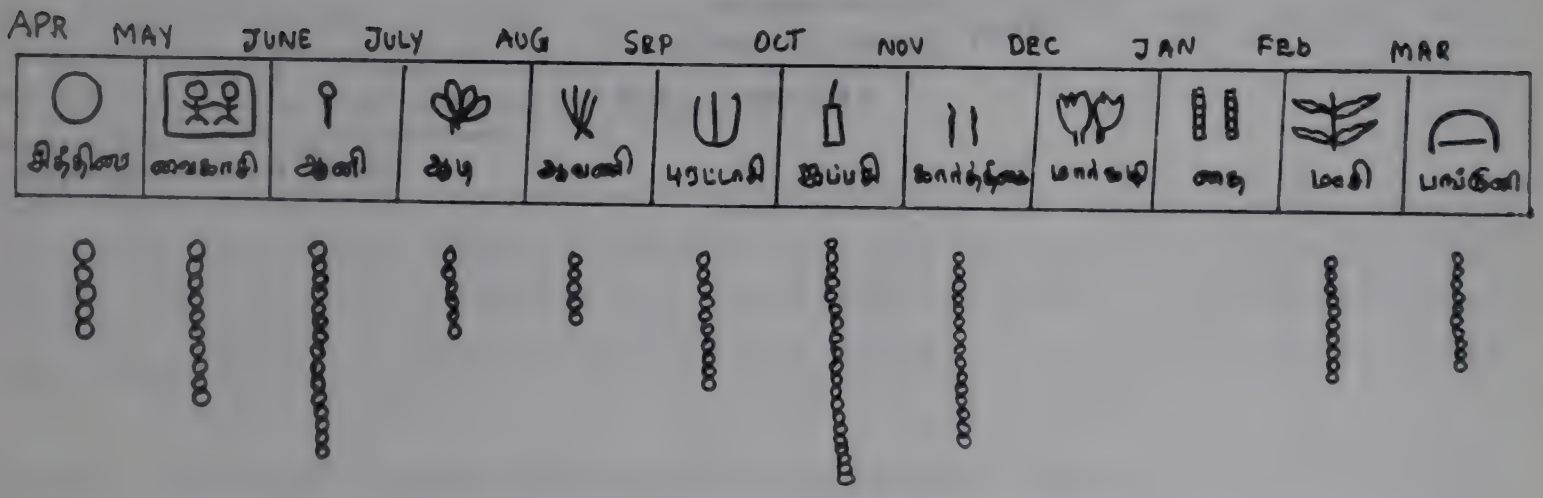
The women did the seasonal calendar on employment with the details on number of days. The men did the seasonal calendar on employment with the details on number of days and source of income. The men used Vadanarayan leaf, dry stick to denote their source of employment i.e., outside work in other towns, and their own farm work respectively.

FIGURES 61, 62

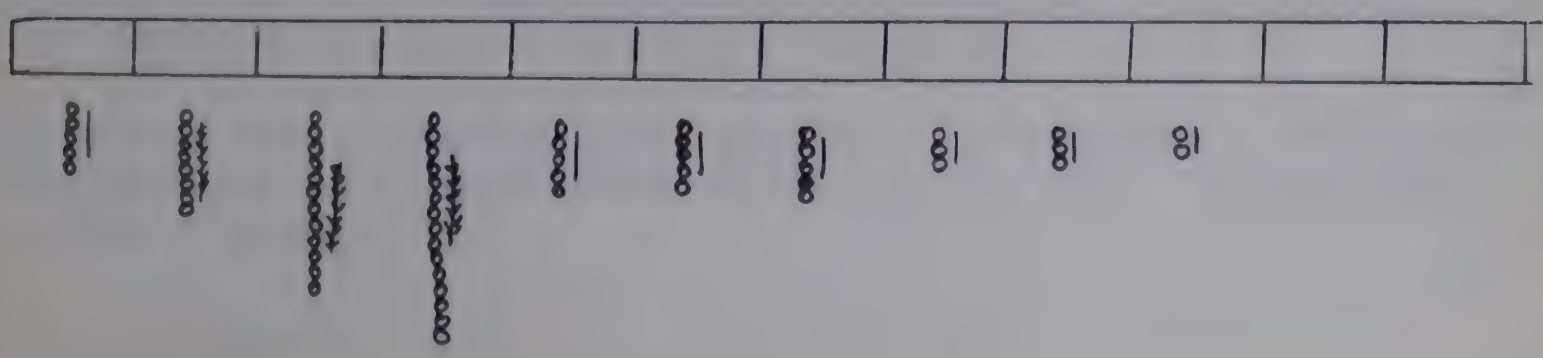
SEASONALITY OF INCOME AND EXPENDITURE IN KUMBARAHALLI VILLAGE, DHARMAPURI DT TAMILNADU.



SEASONALITY ON EMPLOYMENT (WOMEN) KUMBARAHALLI VILLAGE, TAMILNADU.



SEASONALITY ON EMPLOYMENT (MEN)

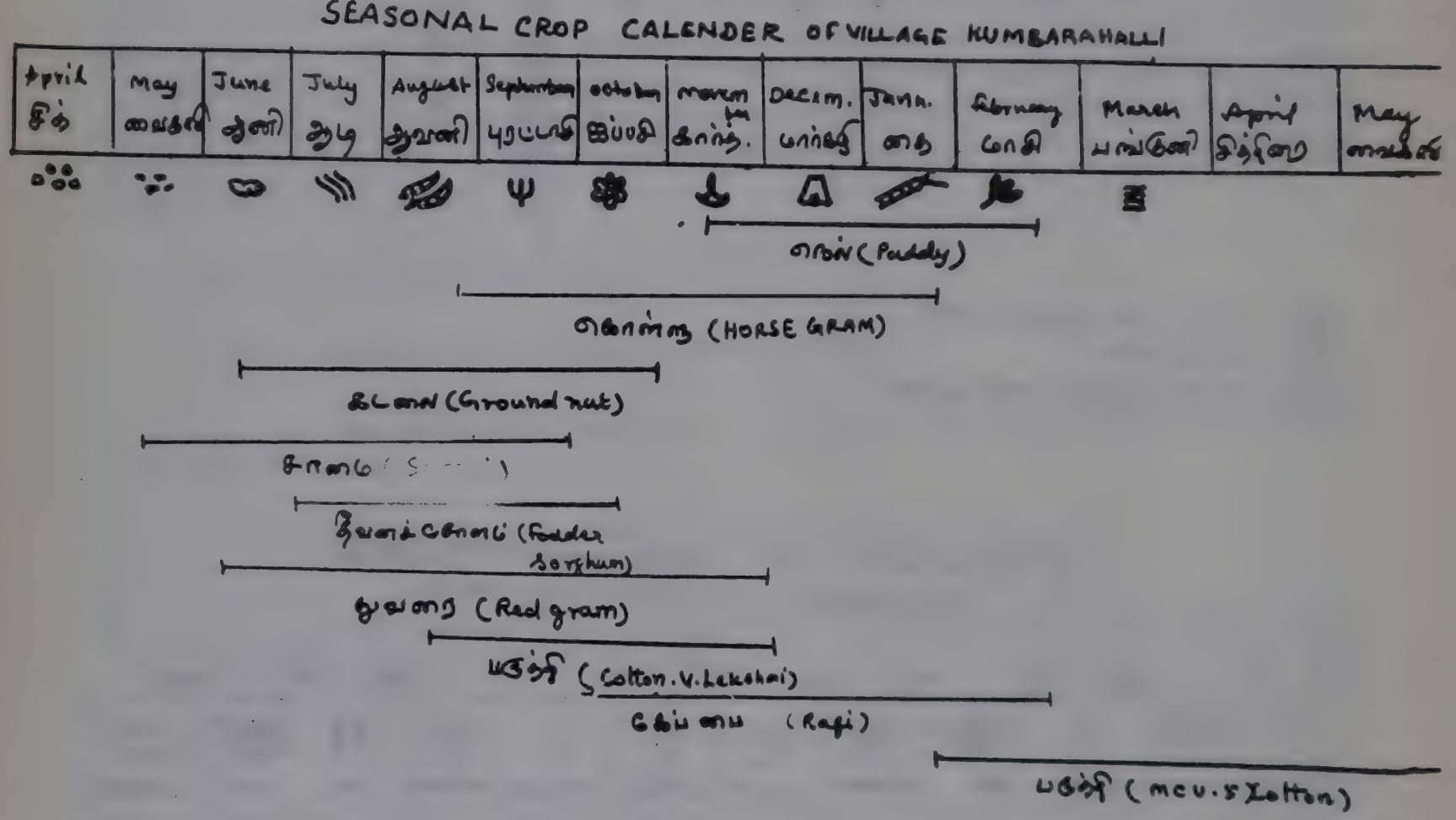


EMPLOYMENT DAYS
THROUGH OTERER SOURCE
IN THIER OWN FARM

13. Seasonal Calendar: Crops

The team enlisted the cooperation of two farmers sitting in front of their hut to find out more about the cropping patterns in the village. The farmers were illiterate, and so used symbols to denote the Tamil Months. We asked them to mark on the ground using chalk to denote the sowing and crop periods for each crop. One indicated the rainfall pattern, whilst another showed the migration of labour for outside work.

FIGURE 63



14. Resource and Nutrient Flows

This exercise was conducted with Mr Munasamy, in his front yard. He took a stick and started to draw on the ground, using coloured powders to distinguish the different component. His was an integrated farm with crops, livestock and trees.

The total area of land available to the farmer was categorised into wet land and dry land. In dry land he raised groundnut, samai and cholam as a single crop and for the rest of the year, it was left fallow. There was no cultivation for the past three years and this year he had a good crop of ground nut. Due to water availability in the tank this year he proposed to raise paddy varieties like Bhavani and Ponni. The seed rate is 3 to 4 vallams (each vallam is 2.5 kg). The seed was purchased locally from a farmer at Rs.30/vallam. The money for it was obtained by doing casual work. If there is no water let from the tank he would draw water using mohote. He applied 2 to 3 cart loads of farmyard manure and then plant the seedlings. He then fertilised with 4 to 5 kg of urea and took up plant protection if necessary, as advised by fertilizer (or) pesticide dealers. He had never sought advice from the Department of Agriculture officials. He weeded the crop, engaging about ten women for two days and got four to five bags of paddy/acre and used the paddy only for house consumption. The paddy straw was stacked at a common place and used to feed his animals for 2 to 3 months.

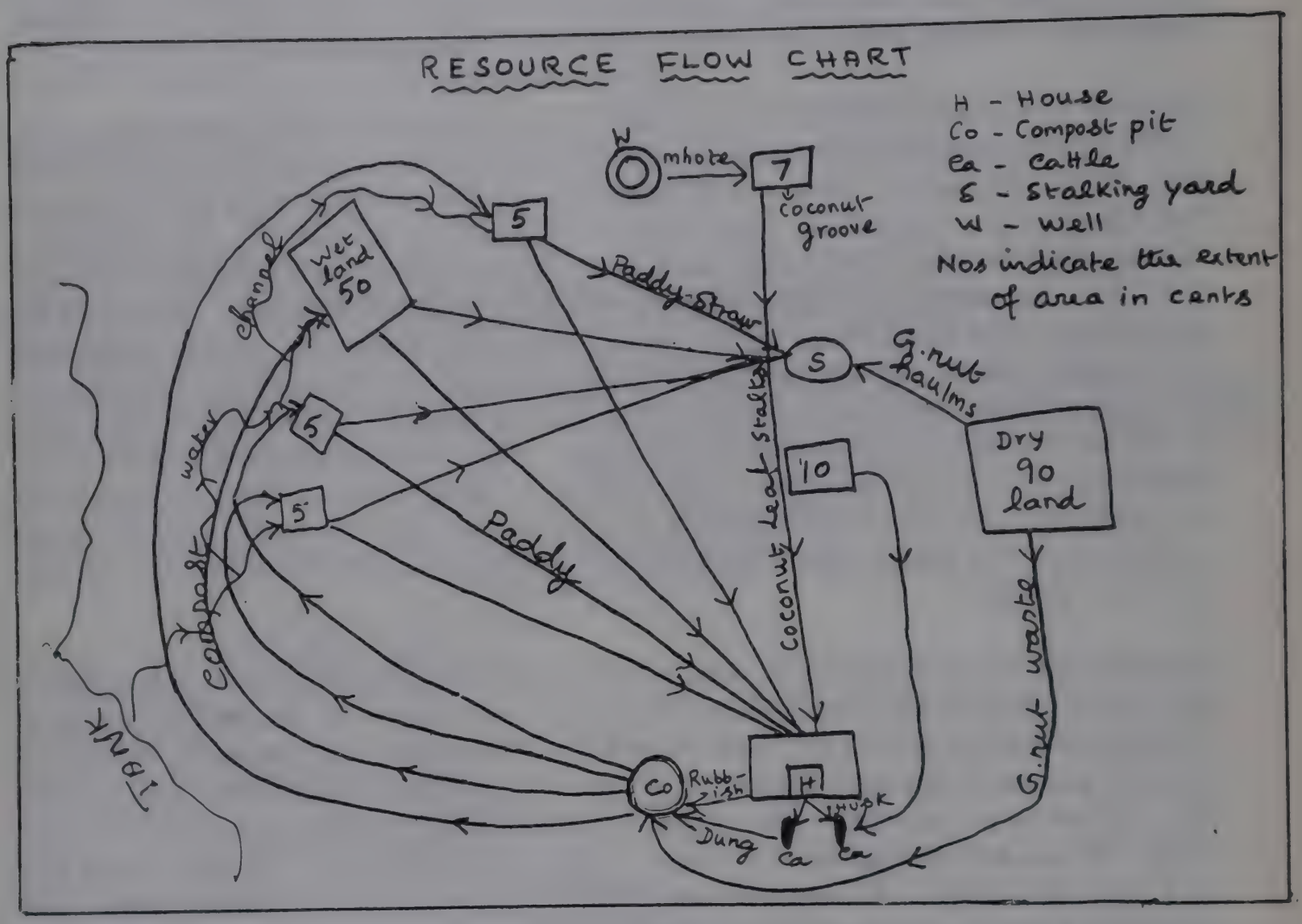
He sowed groundnut during April - May (Chittirai month) in the garden land. It is a bunchy type and he got seeds from Agricultural Department, Karimangalam. He applied 4 cartloads of farmyard manure and 50 cart loads of tank silt. He prepared the land using one pair of bullocks and sowed the seeds behind the plough. It took 4 to 5 women labour and one man with bullock to do the work. He engaged his family members and casual labours for the work. He weeded the crop for 4 to 5 days using 4 to 5 persons/day. He got an yield of 6 to 7 bags (60 kg/bag). He kept half for seed and rest was sold for repaying loans. The groundnut haulms were stored in the common place and used as feed for his cattle. The waste of groundnut was dumped in compost pit.

He sowed cholam during the month of Chitrai (April-May) and if there is enough rains he gets grain, otherwise the cholam is converted as fodder for cattle. The variety is Kakka cholam, Vellai cholam (or) Thalaivirichan. He ploughed the field 2 to 3 times and broadcast the seeds. No plant protection (or) fertiliser was applied. He got 6 to 7 bundles of straw (each bundle weighed 5 kg).

He had a coconut grove with 15 plants which were planted 5 years back but due to drought they did not grow well. He used the well nearby which was common for 15 families to irrigate once in a while. The compost yard at the back had all house wastes and cow dung. It was cleared once in a year and dumped in all fields equally.

The tanks get water if there is good rains and when dry contained silt for 1 to 2 metres which was transported at Rs.4 to Rs.5/cart for increasing the fertility. Their main problem was water availability.

FIGURE 64


RESOURCE FLOW CHART
H - House
Co - Compost pit
Ca - Cattle
S - Stalking yard
W - Well
Nos indicate the extent of area in cents
W
mhole
7
coconut groove
5
Wet land 50
channel
Paddy-Straw
S
G.nut haulms
Dry 90 land
5
water
10
Coconut leaf stalks
5
Paddy
Compost
Co
Rubb-ish
H
Husk
Dung
Ca
Ca
G.nut waste

15. Resource Flows and Venn Diagram

The team gave Mr.K.N.Murugesan a sheet of paper and asked him to identify the institutions and resources available in the village. He started from identifying the village boundary and marked the roads that lead into his village. He then marked the temples, schools, Panchayat buildings, public latrines, milk society, bore wells, ration shop,etc. He then identified wet lands, Garden lands, tanks, poramboke lands, mango groves, palmyrah groves, Tamarind and coconut grooves around the village. He also identified the crops grown in wet lands and garden lands.

He informed that there were about 200 bullocks, 100 goats, 250 sheep, 100 buffaloes, 100 cows, 10 pigs and about 300 poultry birds. The village milk society was formed by the villagers and this helped in marketing their milk produced at Rs 3-4/litre of cow milk and Rs 5/litre of buffalo milk. The goats, sheep and poultry birds were sold in the village shandy based on weight.

The village co-operative agricultural society available at Karimangalam about 3km from the village gave credit by way of fertilizers, pesticides etc. to the farmers in a large way. About 20 members got credit and repaid the loans. For cattle and bullock carts they got loans from Indian bank through IRDP. For goats they got Rs 8000/- for 20 people. 4 persons got Rs 7500/- for bullock carts and 10 persons got Rs 5000/- for buffaloes. All loans are being repaid.

The public latrine constructed at an estimated cost of Rs 15,000/- had a scavenger and was very little used. The panchayat from its mango, neem trees and glyricidia plantation received Rs.2000 income/year.

For health and sanitation there is a hospital at Karimangalam. The Malaria department people come every month and give pills. The veterinary department officers come only after getting information on outbreak of animal diseases.

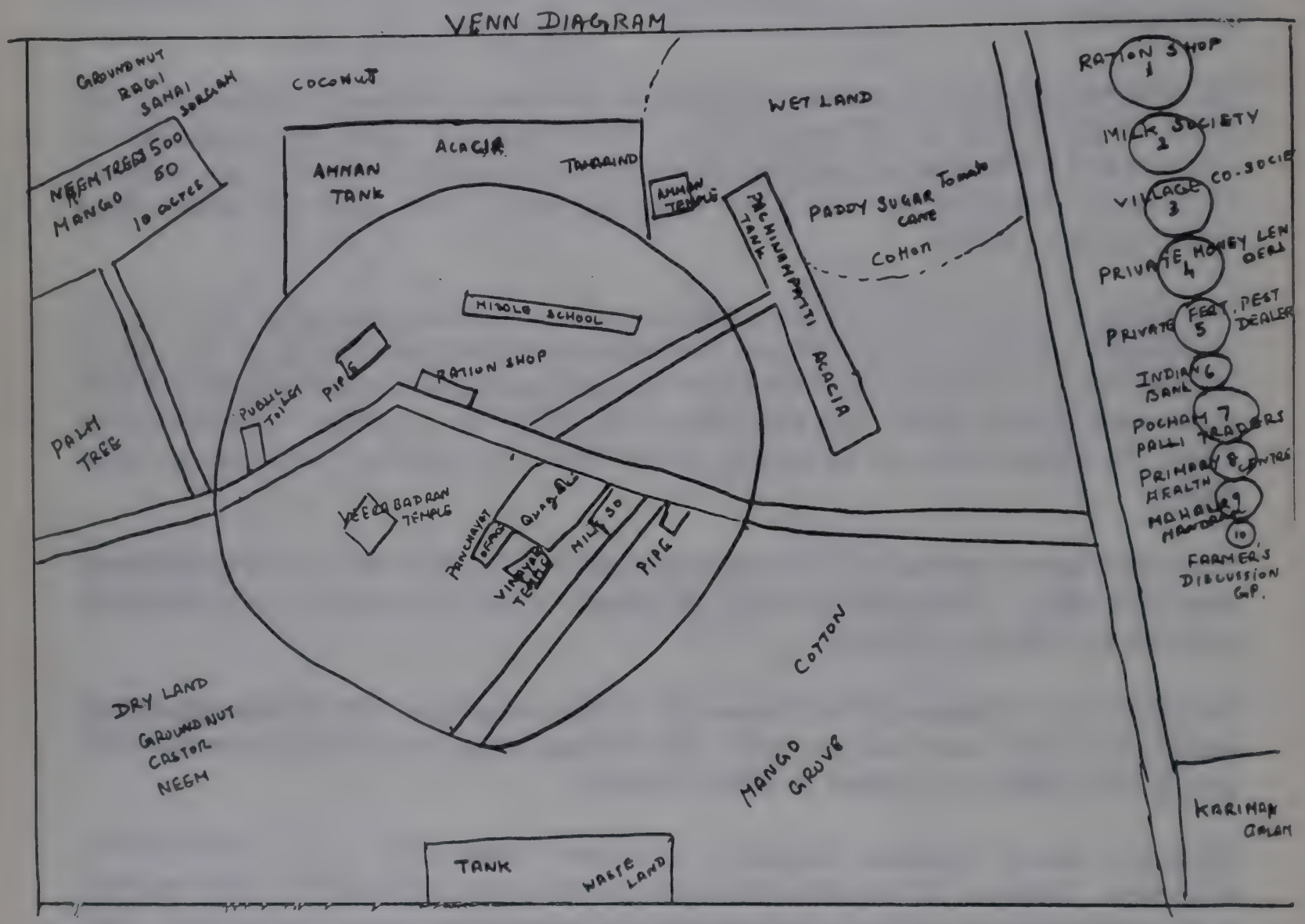
There is a Mahalir Mandram instituted by a voluntary organisation which meets once in 8 to 15 days. There are 20 members which has a revolving fund of Rs.2000/- which was built up by contributions in the form of subscription and interest from money lent members. They market their produce like groundnut, tamarind, cotton and others in Pochampalli and rice at Karimangalam. There is a farmers discussion group which is not functioning.

But rather than place them on the map, he ranked them accordingly:

1. Ration shop
2. Milk society
3. Village co-operative society
4. Private money lenders
5. Private fertilizer and pesticide dealers
6. Indian Bank
7. Tamarind, cotton, groundnut traders at pochampalli
8. Primary health centre
9. Mahalir Mandrams
10. Farmers discussion group

For agricultural problems they consult the elders or other farmers; for marriages the head of the community or caste; for religious functions the astrologers; and for pest and disease control the private traders.

FIGURE 65



16. Resource Flows in Farming Systems of Kumbarahalli

Thiru. Marappan whom the team met right at the work spot in the field agreed to spare his time keeping his works aside. He has 7 acres of garden land. There is a well right in the middle provided with an electric motor and pumpset for irrigation. He has four animals out of which 2 are milch cows. He has planted about 200 mango trees (3 years) and 150 coconut trees (7 years). He takes up cultivation of several crops such as ground nut, blackgram, greengram, lab lab, cotton, ragi, tomato, chillies and paddy. He also takes up a mixed crop of lab lab and groundnut. He makes use of the seeds of the harvested produce as well as certified seeds from the department. He applies the advanced latest technologies as advised by the department.

The crops are grown as intercrops in the interspaces between the trees, so he is practising a practical agro forestry system. He has combined coconut and cotton, coconut and sugarcane, mango and groundnut, mango and paddy and has been successful in such agroforestry systems. He has planted mango and coconut trees with sufficient spacing so as to take intercrops successfully (coconut 30 feet X 30 feet) (Mango 18 X 18).

Energy: He employs 2 men and 2 women labour besides working himself as the manpower resource. He uses hired tractor for operations like ploughing etc. He has one motor and pumpset provided in the well and uses this energy for lifting water from well.

Manures and Fertilizers: He applies farm yard manure obtained from the animals he maintains to the paddy fields only. He also applies groundnut cake obtained from his own produce again to the paddy fields only. As green leaf manuring to paddy he practices the application of neem leaves, pungam leaves, groundnut haulms etc. He applies nitrogenous, phosphate and potassic fertilizers and spends about Rs.4,000/- per year over this.

Pesticide: He has the practice of applying pesticides like Ekalux, Nuvacron and spends about Rs.2000/- per year.

Flow of resources: The paddy grains, green gram, blackgram, ragi, lab lab, mango and coconut are used for his own household and the straw for feeding his cattle. He extracts oil in his own farm. The groundnut oil cake is used as manure for paddy fields. Cotton stalks are used as firewood in the household.
Mangoes, coconuts, greengram, blackgram, groundnut, cotton, are being sold and hence these go out of the system. Cash also goes out by way of lending to relatives & purchase of inputs.

A great deal of information on the various technologies flow into the system from the nearby Regional Research Station, Paiyur and the Agricultural Department. Manpower, electrical power and mechanical power flow into the system from outside.
Nutrient flow: Nutrients flow into the system by way of fertilizers, manures groundnut oil cake, green leaves (like neem and pungam leaves). Nutrient also go out of the system by way of the harvested produce.

FIGURE 66

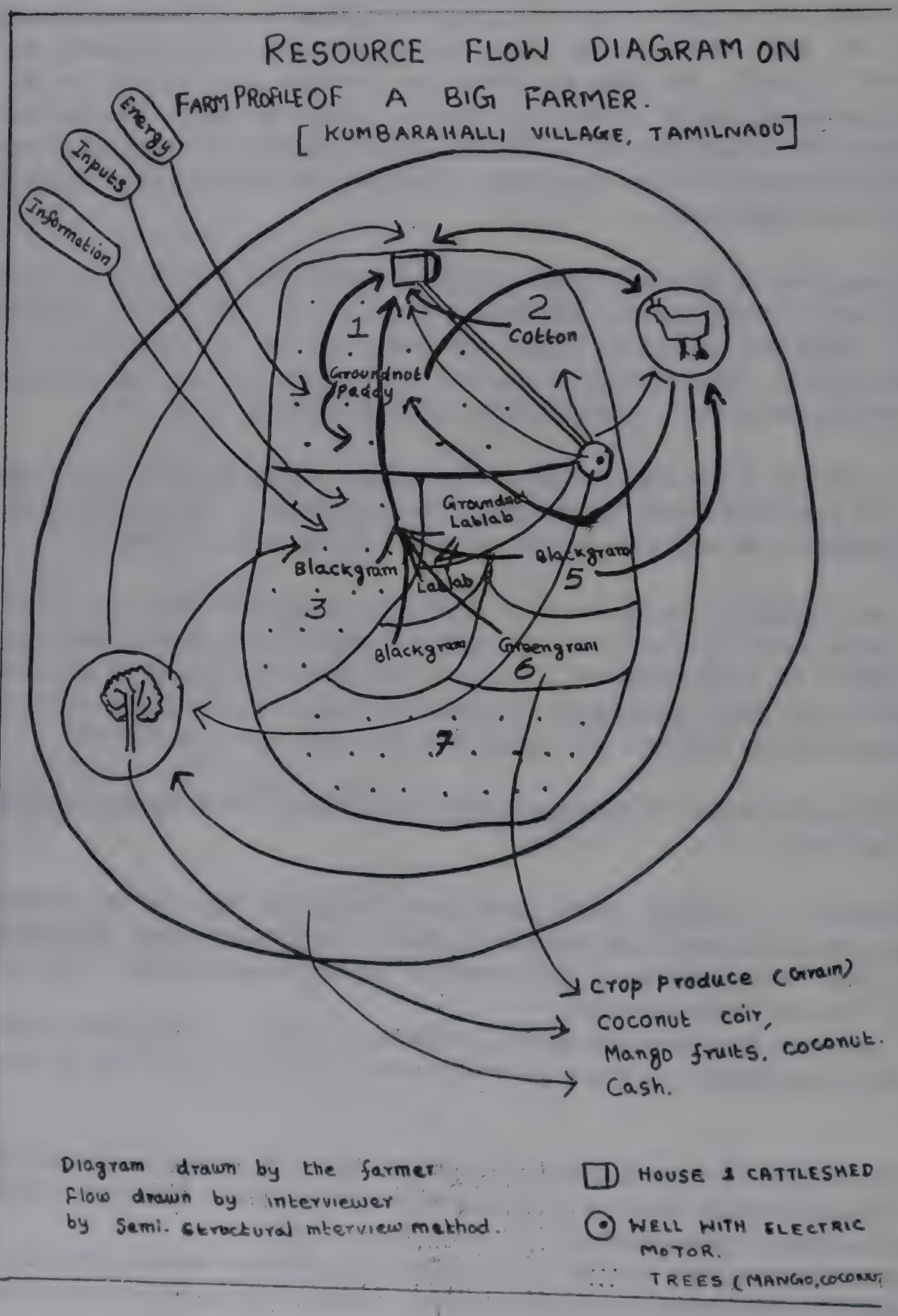
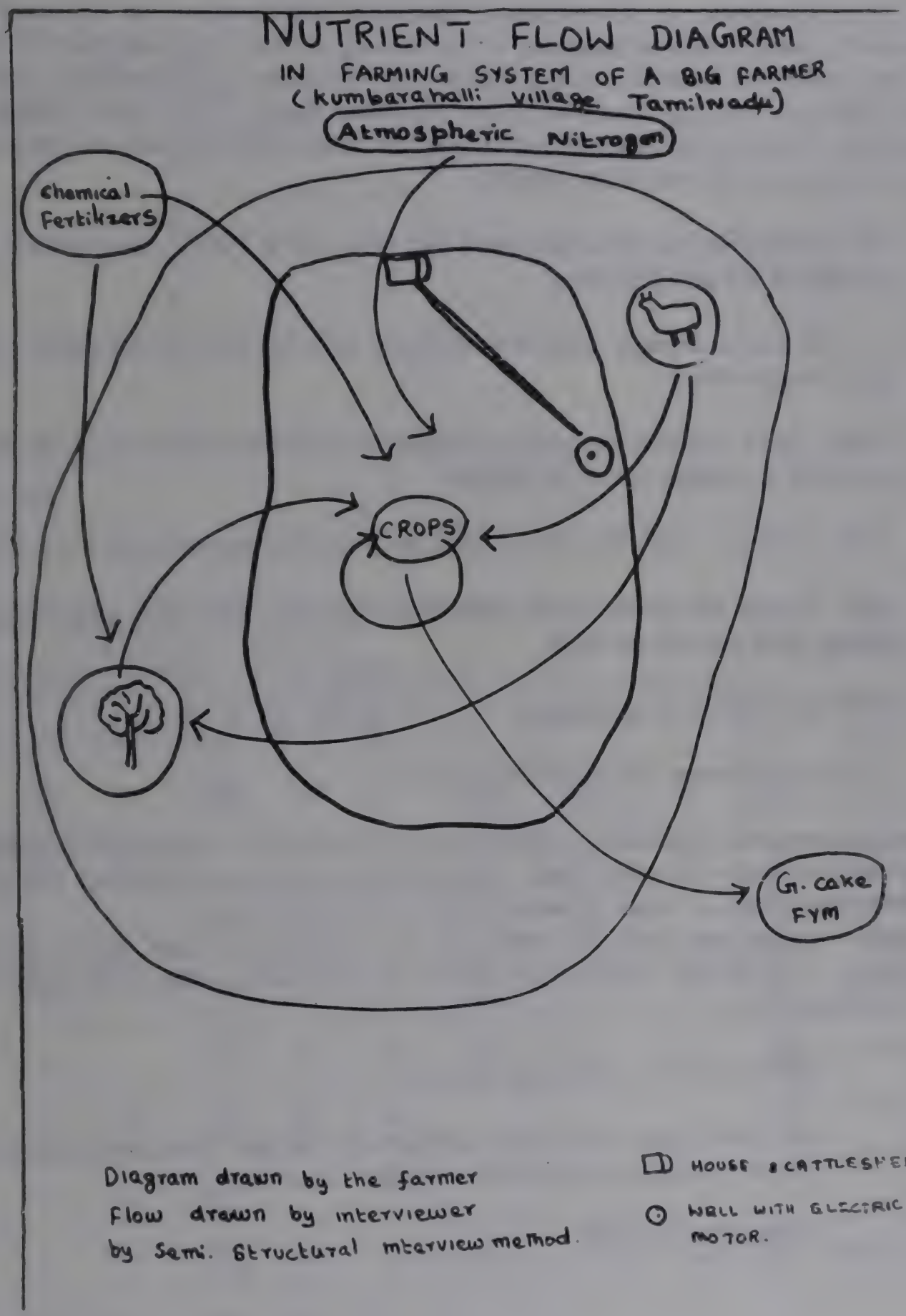

RESOURCE FLOW DIAGRAM ON
FARM PROFILE OF A BIG FARMER.
[KUMBARAHALLI VILLAGE, TAMILNADU]
Energy
Inputs
Information
1
Groundnut
Paddy
2
Cotton
Groundnut
Lablab
Blackgram
3
Lablab
Blackgram
5
Blackgram
Greengram
6
7
Crop Produce (Grain)
Coconut coir,
Mango fruits, coconut.
Cash.
Diagram drawn by the farmer
Flow drawn by interviewer
by Semi. Structural interview method.
HOUSE & CATTLESHED
WELL WITH ELECTRIC MOTOR.
TREES (MANGO, COCONUT

FIGURE 67


NUTRIENT FLOW DIAGRAM
IN FARMING SYSTEM OF A BIG FARMER
(Kumbarahalli village Tamilnadu)
Atmospheric Nitrogen
Chemical Fertilizers
CROPS
G. cake
FYM
Diagram drawn by the farmer
Flow drawn by interviewer
by Semi. Structural interview method.
HOUSE & CATTLESHED
WELL WITH ELECTRIC MOTOR.

17. Matrix Scoring: Assessment of Productivity and Sustainability of Individual Fields on a Farm

With Thiru.Marappan, a semi-structure interview was conduct ed to ascertain the productivity, stability and sustainability of his farming system. He recognises his fields by the crops grown and when the land is fallow, and identified by designating as first field, second field etc. He has identified seven individual fields. For matrix scoring on the productivity of each of his fields during the past ten years, the specimens of crops and trees grown were kept at the top of the column.

- The productivity has been very good over this year ie.1991 in all his fields and it is the best in the past ten years.
- In 1990 due to drought water was sufficient only for three of the fields. This is a post drought effect.
- 1989 : There was total drought and practically no income from any of his plots. He was able to manage out of his savings.
- 1986, 1985 and 1983: No crop in field No.7 and the coconut trees were small.
- 1982 Though the coconut trees were small there was sugarcane crop and he could realise some income out of it.
- 1984 and 1986 were good years.
- 1989 was the worst year according to him.

The best crop and tree combination according to his assessment is Mango and groundnut plot and the next is coconut and cotton plot. From his memory he could recollect that 1975 and 1989 were good years in terms of productivity in the past 20 years.
The matrix scoring was used for comparing the interplot and inter year variations in productivity. The number 2 field of the farmer is comparable to that of the poor farmers field in productivity.

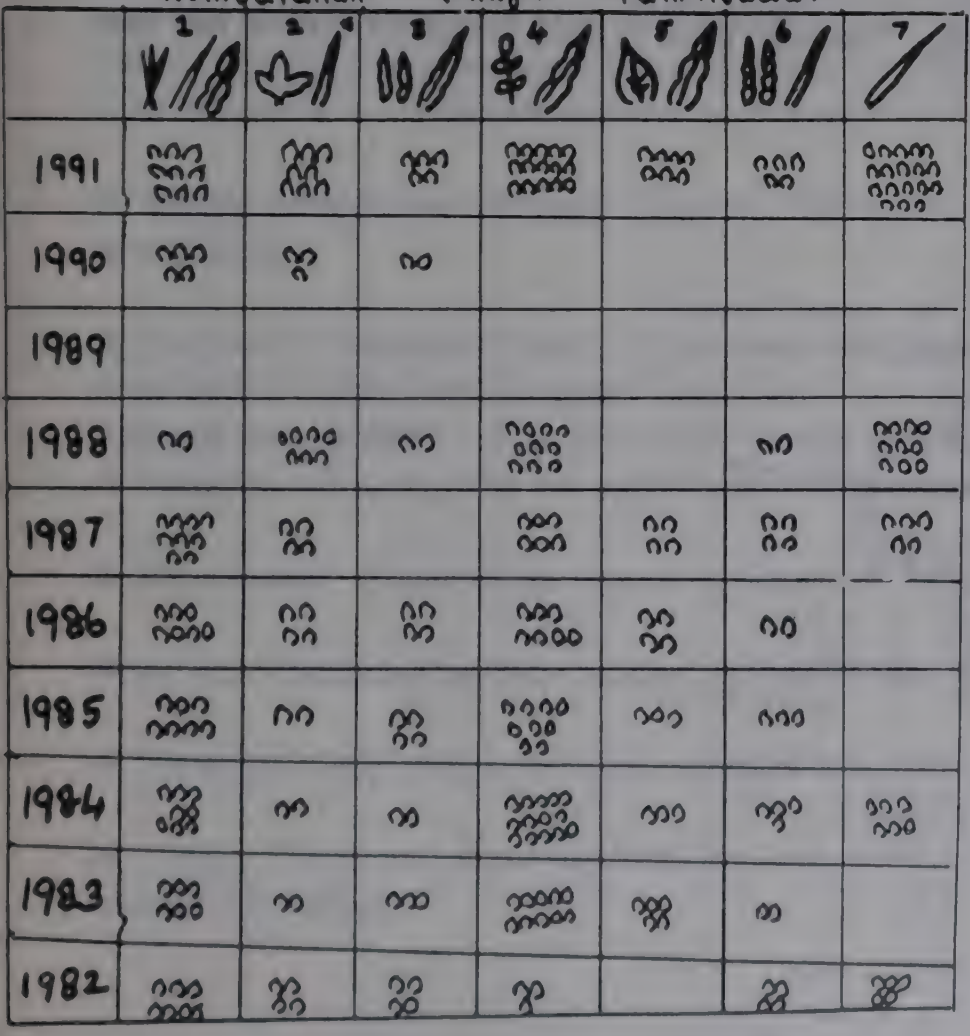
1988	the poor farmer cultivated one acre
1990	the poor farmer had a better productivity than the farmer since this time, this farmer limited his cultivation to certain area only.
1991	Similar productivity

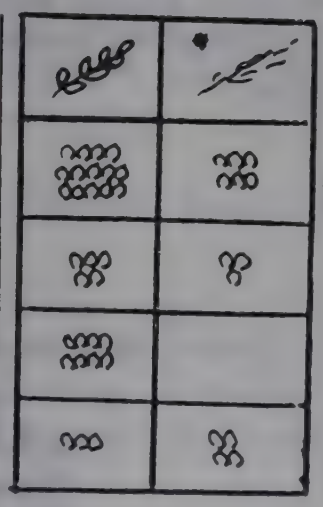
He was also asked to compare the productivity with that of a better farmer than him and a poor farmer and the result is as follows.

Year	Better farmer 10 acres + well	Poor farmer 2 acres + well
1991	14	6
1990	5	3
1989	8	-
1988	3	4

FIGURE 68

MATRIX SCORING ON PRODUCTIVITY OF A FARMING SYSTEM.
Kumbarahalli village. TamilNadu.





LEGEND.

- Paddy
- CoConut
- Cotton
- Blackgram
- Groundnut
- Mango
- Lablab
- Greengram
- Better farmer
- Poor farmer

The flowers of Pannai Keerai weed was used for matrix scoring.

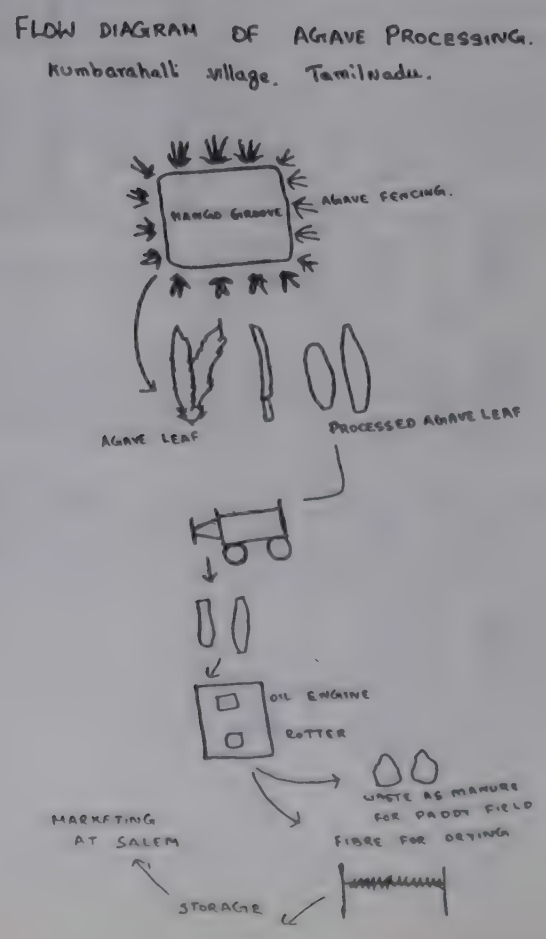
18. Flow Diagram: Agave Processing

During the transect walk, the PRA team came across agave agro-industry in the village. Mr.Iircha gounder is 60 years old. He informed that he purchased Agave plants from the village for Rs.200 to Rs.400 an acre depending on their growth. He got about 4 cart loads/acre. He made one cutting per year. He possessed one oil engine with roller. Eight persons are employed and there is a woman also for cooking food to the workers. The men are paid Rs.15/day and woman Rs.10/day, with 3 meals. He employs 6 persons to cut the agave plants and remove the thorns. He pays Rs.15/- for carting and there are 4 cart loads. The agave plants are picked and supplied by 2 persons and two feed into the machine. One cleans the debris and two dry the fibre. The plant sheath is inserted 2 times and materials dried for 2 days. The pulp is causing irritation and thorns prick which resulted in bleeding. It takes 2 days for harvesting, one day for extraction and two days for drying.

It is transported to Salem for sale at Rs.150/tonne and from there it goes to Calcutta. The waste materials are used as manure and it gives resistance to pest and disease. If dumped in large quantities it induces more vegetative growth thereby leading to more incidence of pest and disease. The rate per kg of Agave fibre is Rs.5.50.

When probed further it was found that the water cooling system for his oil engine had a drum with water and the water is recycled. The outlet had a old kerosene tin with perforations when the water from the oil engine drops into the tin and flows back to the drum it comes down as a shower and is air cooled. So the same water could be reused without being changed often for cooling. The individual is able to get Rs.100/= per four cart loads as net return.

FIGURE 69



19. Key Issues and Problems

■ *Drought and Waterlogging*: The entire village depends on monsoon rains for cultivation. The farming operations could not be carried out for the last 3 years, whereas this year they received copious rains which is more than the normal. Hence water table in all the wells has increased and the 4 tanks in and around the village are overflowing, causing waterlogging in farmers fields.

■ *Crops:* By seasonal crop calender and transect walk it was observed that farmers cultivate only traditional varieties of rainfed crops like horsegram, ragi, sorghum, groundnut, redgram, lab lab and cotton. Under irrigated conditions paddy, sugarcane and groundnut were raised. Tree crops namely mango, coconut are also grown. Low productivity in all these crops were noticed.

■ *Labour Decisions:* During puratasi (September-October) and Adi (June-July) when rains were received sowing of the rainfed crops were taken up. During Thai (January-February) irrigated crops in small pockets were raised. During summer (March,April,May) the men labour migrate to Bangalore city for earning livelihood as casual labourers in construction of roads buildings deepening of wells, brick making etc. Agricultural labourers do not get employment opportunities throughout the year.

■ *Soils:* The village has predominantly red soils. Patches of alkaline soils and sandy soils are noticed. Red soils are not fertile having low water holding capacity and poor nutrient status. Topography is somewhat undulating in many places. Igneous rocks are scattered over the surface. Soils are shallow and deeper in some places.

■ *Weeds:* Weeds like Hariyali, Cyprus, Keelanalli, Thumbai, Poonai mullu are a menace everywhere.

■ *Decline in Common Property Resources:* During historical transect, it was observed that area under rainfed and irrigated agriculture have increased. However, forest cover was reduced considerably. The area under mango has in creased significantly due to resistance to drought. Grazing land for animals had been reduced.

■ *Implements:* Farmers are not using improved implements for agricultural operations.

■ *Advice:* Extension agency support is found to be lacking.

■ *Varieties:* Only longer duration varieties are cultivated.

■ *Credit:* Credit and input organisations are functioning independently. They are situated outside the village.

20. Opportunities

- Dry farming technologies must be popularised among the farmers by the extension workers of development departments in close cooperation with voluntary agencies.

- Farmers must be made aware of contingency plans with respect to diversified farming and allied agricultural enterprises .
- Starting of KVK at Paiyur would facilitate the farmers to have a better link with the scientists for knowing the latest technologies.

- Conduct of onfarm trials and demonstrations must be taken up on a large scale in farmers holdings by the University and state department of Agriculture.

- Agro-based industries and self employment programmes must be started.

- Based on soil test results, application of gypsum is recommended for alkaline soils. Also in situ ploughing of green manure crops like daincha, sesbania can be taken up. For improving sandy soils tank silt may be applied. Application of organic and inorganic manures and fertilizers must be popularised among farmers for improving the fertility of the soil.

- Summer ploughing is recommended for soil and water conservation and also for control of weeds.

- Services of financial and input organisations must be strengthened.
- Training on PRA methods must be given to the extension workers and scientists.

22. Sustainability Analyses: Options for Research, Extension and Policy

In order to assess more clearly the options for research, extension and policy, the PRA team used sustainability analysis matrices. The analysis focused on the activities of two types of farmer, rich and poor. The output and input indicators were then derived, and used to establish the strengths and weaknesses of the existing system - what farmers already do well, and where they clearly need help. This led directly to a research, extension and policy agenda derived from local analysis and understanding.

FIGURE 70

Sustainability analysis

farmers system activities	Goals and objectives	output indicators	Impact indicators	Existing Strength	System weakness	RES Response	Extn.	Policy
Small farmers System Paddy, Sorghum g.nut, Coconut + 2 draught animals	Enough food for family and Cattle + Marketable Surplus	Grain fodder and fuel for Cooking	Repayment of loan Cash for purchase of inputs FYM	Withstands drought Resistant to pests and diseases		Research More research on growing Sorghum for grains and cutting it for fodder. Where is no Rains Combe intensified. More. Res. on easy recycling of paddy Straw and g. nut haulms as FYM Can be continued. Effective recycling of house Sweepings and dung by way of effective Composting is a must. Extension. Nothing is happening Policy. Subsidies on dry land crop seeds can be continued for some more time.	On-farm trials on growing g.g.nut with R.gram Sorghum + Cowpea or Lab-Lab should be continued. Intercropping in Coconut + b.gram or g.gram Combe done as on-farm research. Group Contact and writing of area Specific message for the village should be undertaken immediately as the Extension agency had lost contact from April on wards. Starting KVK to cater the needs of the farmers. Price fixation policy for dry land crop should be initiated.	There is no li between the ext Sim agency an farmers. This should be immediately st and proper Co restored. Non Collatera loans to be started and sen taplism of proce of loan appln. abolished.

FIGURE 71

FARMERS SYSTEMS ACTIVITIES	GOALS AND OBJECTIVES	OUTPUT INDICATORS	IMPACT INDICATORS
RICH FARMER (7 ACRES) CROPS: Paddy Sugarcane cotton Groundnut Blackgram Greengram Lablab. TREES: Mango Coconut 2 pairs of animals. Experimenting Tapioca	- Produce for household needs. - Marketable Surplus - Overcoming risks like drought etc.	- Yield of crops - Yield of fruits - Crop by. products - Milk from animals - FYM - Animals for draught purpose.	- Investable surplus - Self sustainable in credit - Selection of efficient enterprises - Withstanding the drought - Good quality of living.

EXISTING SYSTEM		RESEARCH / EXTENSION / POLICY RESPONSE		
STRENGTHS	WEAKNESSES	WHAT SHOULD BE CONTINUED	WHAT NEW ACTIVITY SHOULD BE STARTED	WHAT SHOULD BE STOPPED
- Indigenous knowledge - Efficient use of water resources. - Compact holding - Animal component - Recycling of Animal manure, oil cakes, crop residues, prunings of trees for maintaining soil fertility - off farm activity by wife - Synergy due to enterprise mix - Urg for diversity in sp. combination. crop rotation.	- Unable to harvest under severe drought conditions	Research: There are no research programmes presently. Extension: Information on fertiliser and pest problem from Researchers (RRS) and extension agencies to be continuously furnished. Policy: The price policy of crops like Paddy, Sugarcane, Groundnut, cotton etc. to be continued.	Research: - Tree research to incorporate farmers evaluation criteria such as drought tolerance, soil suitability, leaf duration etc. - on farm participatory trials on agro forestry Systems & their impact on seasonal crops & soil properties. Extension: - The extension staff can do PRA and report back RRS during zonal workshops. Policy: - To policy dialogue on value added Process Industry, crop insurance in drought prone areas, cyclical credit policy, farmers may be involved. - There should be shift in research policy to adopt PRA methods.	Research: - conducting Research without actual problem diagnosis. - commodity based on farm trials Extension: We are not sure. Policy: - Fertilizer subsidy

23. Lessons Learned About the PRA Process

- When we wanted to learn, it was better to be in the field;
- We should go to the farmer's place rather than asking them to come to a place of our choice;
- We should learn from all knowledgeable farmers, rather than classifying based on literacy;
- There are many possibilities for learning about indigenous technologies;
- The transect walk could have included problems of the farmers belonging to the zones of the villages and solutions offered by them;
- In village mapping, enterprises, resource availability could have been included;
- Coins used by farmers for scoring in historical transect do not reflect precisely;
- Historical time line of a farmer reflected about village rather than farmers chronology of events;
- Matrix scoring combined with semi structured interview is considered by the group as most useful among all the PRA methods - it can give a picture of the likes and dislikes of an enterprise and give a sense of priorities;
- Farm profile and resource flow diagram helped to get maximum details on individual farming system;
- Triangulation is the key to the success of all PRA methods;
- The services of children can be effectively used in preparing the maps;
- PRA develops a good rapport with the village.

APPENDIX C: Workshop Programme and Details of Training Process

Regional Research Station, Paiyur

12-20 December, 1991

Day 0 Eve	1. Stepping Stones and Expectations
11.12	2. Introductions
	3. Workshop Programme
	4. ICRISAT Video on Farmer Participatory Research
Day 1 AM	1. Systems Thinking and Agricultural Research
12.12	2. PRA Principles and Concepts
	3. Semi-structured Interviewing
	- Pictures: Do's and Dont's
PM	4. Semi-structured Interviewing (continued)
	- Six helpers
	- Facts, Opinions and Rumours
	- Role Play
	- 'But Why' Game
	- Leading questions
	5. Fruit Salad
	6. Matrix Scoring - introduction
	7. Matrix Scoring Practice Session
	8. Buzz Session
Eve	9. Video viewing - MYRADA
Day 2 AM	1. Mapping and Modelling of Resources
	- Natural Resources
	- Social Resources
	2. Mental Mapping: Neighbourhood Map
	3. Vegetable Stew
	4. Mental Maps of Different Community
	5. Slides of Mapping and Modelling
	6. Transect Walk of Experiment Station
PM	7. Mapping and Modelling Practice Session
	8. Review Modelling
	9. Buzz Session
	10. Team Contract
	11. Checklist
Day 3 AM	1. Field Work - visits to villages
14.12	
PM	2. Field Work (continued)
Eve	3. Processing of Field Exercises

Day 4 AM
15.12

1. Jules Depart
2. Presentation
3. Buzz Session
4. Agroecosystem Analysis
5. Time Lines
6. Historical Transect
7. Crop Biographies
8. Seasonal Analysis
   - Rainfall Distribution
   - Employment (Gender-differentiated)
   - Food Availability
   - Crop Calendars
   - Income, Expenditure and Credit
9. Slides on Time Lines, Seasonal Analysis

Field Work

PM Field Work (continued)

Eve Processing of Field Exercises

Day 5 AM
16.12

1. Presentation and Review of Field Exercises
2. Clarification of Terms, Diagrams, Perceptions
3. Buzz Session
4. Beverage Cocktail
5. Problems, Difficulties and Doubts with PRA Methods
6. Problem-Solution Wheel

PM
7. Clarifying Confusions about PRA Methods
8. Flows and Decisions
   - Resource Flows
   - Nutrient Flows
   - Venn Diagrams
   - Decision Trees
9. Agroecosystem Properties and Trade-offs
10. Slides on Flows and Decisions

Field Work

Eve Processing of Field Exercises

Day 6 AM
17.12

1. Field Work (continued)

PM Visit Hogganaikkal Falls
Return 2200 hrs

Day 7 AM
18.12

1. Processing of Field Exercises
2. Presentation and Review of Field Exercises
3. Buzz Session
4. Identification of Problems and Key Issues
   - Short term
   - Long term
   - Research Implications

PM
5. Group Exercises in Integration of Information and Analysis
6. Presentation
7. Difficulties in Problem Formulation and Integrating Systems Thinking
8. Warm up Exercise
- If you are happy ...
9. Problem Prioritization and Scoring
10. Farmer Participatory Diagramming to trace Casual Effects

Eve
Visit Bergur and Shopping

Day 8 AM
19.12
1. Warm up Exercise
- Sharing Good News
2. PRA Documentation Plans
3. Group Activity on Documentation

PM
4. Sustainability Analysis
5. Group Activity on Sustainability Analysis
6. Group Photograph
7. Fruit Salad
8. Warm up Exercise
- Sh ...g of experiences during the Workshop through Symbols
9. Preliminary Presentation on Sustainability Analysis

Eve
10. Sustainability Analysis (continued)

Day 9 AM
20.12
1. Presentation and Review of Sustainability Analysis
2. Agricultural Research System: Prospects of Integrating Farmer-Friendly Methodologies
3. Follow up Action Plans

PM
4. Fruit Salad
5. Constraint-Solution Wheel
6. Consolidation of Action Plans
7. Presentation and Discussions
8. Consolidation of PRA Documentation
9. Informal Feedback Session with Dr. S. Chelliah, Director (Research), TNAU

APPENDIX D: LIST OF PARTICIPANTS AND RESOURCE PEOPLE AT PAIYUR WORKSHOP

G Doraiswamy
Associate Professor
(Agricultural Engineering)
Krishi Vigyan Kendra
Coimbatore 641 003
India

V Ravichandran
Assistant Professor
(Agricultural Extension)
Agricultural College & Res Inst
Madurai 625 104
India

N Shanmugavalli
Assistant Professor
(Agricultural Botany)
Agrl College and Res Inst
Killikulam, Vallanad Post
Chidambaranar Dist 627 252
India

P Nasuredeen
Assistant Professor
(Agrl. Economics)
Tamil Nadu Agricultural College
Kumulur, Pallapuram Post
Trichy Dist 621 712
India

K Natarajamoorthy
Assistant Professor
(Agricultural Botany)
Tamil Nadu Rice Research Inst
Aduthurai 612 101
India

S Devarajan
Assoc Professor
(Agricultural Economics)
Tamil Nadu Rice Research Inst.
Aduthurai 612 101
India

Thiagarajan
Assistant Professor
(Agricultural Extension)
Kumaraperumal Farm Science Centre
Trichy 620 009

K S Devarajan
Associate Professor
(Agricultural Botany)
Sugarcane Research Station
Sirugamani 639 115

S Jeeva
Assistant Professor
(Horticulture)
Krishi Vigyan Kendra
Vridhachalam 606 101

V A Sakunthala
Assoc Prof Agronomy
Sugarcane Research Station
Melalathur 635 806
India

C Chinnusamy
Assistant Professor (Agronomy)
Coordinated Agronomic Expt Scheme
Regional Research Station
Paiyur 635 112
India

Amala Das Devakirubai
Assistant Professor
(Food Science & Nutrition)
Agricultural Research Station
Srivilliputhur 626 125
India

V Natarajan
Assoc Professor (Agronomy)
Agricultural Research Station
Kovilpatti 627 701
India

M Shanmugam
Assoc Professor (Soil Science)
Forestry College and Res Inst
Mettupalayam 641 301, India

A Palachamy
Assistant Prof (Agronomy)
Forestry College and Res Inst
Mettupalayam 641 301
India

V Geethalakshmi
Assistant Professor (Agronomy)
Agricultural Research Station
Aliyarnagar 624 101

B Chandrasekaran
Assoc Professor (Agrl Extn)
PAJANCOA
Karaikal
India

R Ganesan
Assoc Professor (Agrl Extn)
Horticultural College & Res Inst
Periyakulam 626 501
Madurai District
India

J Krishnarajan
Professor (Agronomy)
Agrl College & Research Inst
Coimbatore 641 003
India

A Palaniswamy
Assistant Director
(Information Service)
Tamil Nadu Agrl University
Coimbatore 641 003
India

S R Subramanian
Professor (Agrl Economics)
Tamil Nadu Agrl University
Coimbatore 641 003
India

R Dasarathan
Field Demonstration Officer
Karimangalam,
Dharmapuri Dist
India

Jules Pretty
Director
Sustainable Agriculture Programme
IIED
3 Endsleigh Street
London WC1H 0DD

Ajay Kumar
Agricultural Research Inst
Rajendra Agrl University
Patna, Bihar
Mithapur 800 001
India

J P Bernard
MYRADA-Plan Dharmapuri Project
B-88, SIPCOT Housing Colony
Hosur 635 126
Dharmapuri, India

Janardhana Rao
Training Officer
MYRADA Talavadi Project
Thalamalai (PO) 638 461
India

K C John
The Ford Foundation
55 Lodi Estate
New Delhi 110 003

A Lakshmanan
Agrl Dev Officer
Karimangalam
Dharmapuri Dist
India

P Shanmugam
Deputy Agricultural Officer
Kaveripattinam 635 112
Dharmapuri District
India

R Rajagopalan
Professor & Head
Regional Research Station
Paiyur 635 112
Kaveripattinam (via)
Dharmapuri (DLSH), Tamil Nadu

APPENDIX E: SUMMARY OF PRA PRINCIPLES & METHODS

Recent years have seen a remarkable expansion in participatory learning in research and extension planning, management and monitoring. Most common are the approaches of Participatory Rural Appraisal (PRA) and Rapid Rural Appraisal (RRA), which have strong methodological and conceptual similarities with Agroecosystem Analysis, Farmer Participatory Research, Participatory Action Research, Naturalistic Enquiry, *Methode Acceleree de Recherche Participative* and many more. These grew out of dissatisfaction with two common modes of investigation, formal questionnaire surveys and rural development tourism.

Questionnaires tend to be long, costly and prone to distorting non-sampling errors, and the short and often rushed visits to field sites by consultants, officials and researchers are characterised by haphazard data collection and superficial contact with local elites. The methods of RRA, and lately of PRA, emerged in the 1980s as alternatives to these two common approaches. They now comprise a rich menu of visualisation, interviewing and group work methods that have proven valuable for understanding the local functional values of resources, for revealing the complexities of social structures, and for mobilising and organising local people.

These methods are based on principles aimed at offsetting the deficiencies in the former investigative approaches:

- professionals work in multidisciplinary groups, adopting sensitive attitudes and devolving the analysis to local people;
- learning is from and with rural people, as professionals explicitly recognise the need to understand local knowledge, skills and practice;
- learning is rapid and progressive, as sequences of methods are applied iteratively, rather than in a fixed blueprint style;
- the range of conditions and extremes are sought out through purposive sampling to ensure that action is based not solely upon the averages;
- probing and triangulation of methods and sources of information ensures reliability and validity.

The success of these methods in a wide range of development contexts is derived from the discrete and easily applied methods, the appropriate attitudes of both technical and social science professionals, and the shared analyses between disciplines and between professionals and local people. Where these elements are present, then PRA can be more cost-effective in both time and money than more conventional approaches to surveying and mobilisation.

1. *Review of Secondary Data*

Secondary data can help a great deal; it can also mislead. Secondary data is not heavily stressed when concentration is upon the reorientation of outsiders and participation of villagers.

SUMMARY OF PARTICIPATORY RURAL APPRAISAL METHODS

Visualised Analyses
- Participatory mapping and modelling (resource and social maps)
- Aerial photograph analyses
- Seasonal calendars
- Daily and activity profiles
- Historical profiles and trend analyses
- Time lines and chronologies
- Matrix scoring
- Preference ranking
- Venn and network diagrams
- Systems and flow diagrams
- Pie diagrams

Interviewing and Sampling
- Semi-Structured Interviewing
- Transect walks and group walks
- Wealth ranking
- Direct observation
- Focus groups
- Key informants
- Ethnohistories and futures possible
- Matrices
- Traditional practices and beliefs

Group and Team Dynamics
- Team contracts
- Buzz sessions and reviews
- Rapid report writing
- Work sharing (taking part in local activities)
- Villager and shared presentations
- Self-correcting notes and diaries

2. ***Observe Directly***

It has been striking for many outsiders to realise how much they do not see, or do not think to ask about. Observation should be related to questions. Always probe for reasons for what you see. Use what, when, where, who, why, how?

3. ***Work Sharing***

Many field exercises emphasise the value of outsiders being supervised and taught by villagers. Roles are reversed, in which the villagers are clearly the experts; outsiders soon learn how much skill is required, say, to plough a furrow. Do-it-yourself prompts changes in attitude. Other examples of activities include levelling a field, puddling, transplanting rice, weeding, building stone gully plugs, lopping tree fodder, cutting and fetching firewood, digging compost, sweeping and clearing, washing clothes, drawing water from a well, thatching, plastering a house and many more.

Plate 5. Social mapping of Appanaickenpatty village (see Figure 1 in Aruppukottai report)
Photo: John Devavaram

Plate 6. Social mapping of Appanaickenpatty village (see Figure 1 in Aruppukottai report)
Photo: John Devavaram

Plate 7. Villager transferring social map to paper, Appanaickenpatty
Photo: John Devavaram

Plate 8. Final social map, drawn by villagers, Appaickenpatty
Photo: John Devavaram

4. ***Participatory Mapping and Modelling***

This is marking, drawing and colouring on the ground by rural people with the minimum of interference and instruction by outsiders - for example "do you know how to make a map of your village?" In addition, great play is made of the issue of *who holds the stick*. The person who holds the stick talks about what is most important to them. Outsiders use local materials, such as sticks, stones, grasses, wood, cigarette packets, tree leaves, coloured sands and soils, rangoli powders; but many also bring outside materials, such as coloured chalks, pens and paper. But paper and pens are media that outsiders are familiar with. For villagers it can be quite different: their hands shake when they hold a pen, and when they get to the edge of the paper, they stop. Some organisations are using mobile models of clay and card that can be moved from village to village and rearranged. As maps and models take shape, more people become involved, and so want to contribute and make changes. Often when the map is left as the group moves on for focused discussions, or to go on a transect walk, another group of villagers takes over and makes further changes. This sequential development is very important. Participatory mapping is not a one-off - one leads to another to another, and this development encourages further participation.

There are several types of maps and models and many uses:

- resource maps of catchments, villages, forests, fields, farms, home gardens;
- social maps of residential areas of a village;
- wealth rankings and household assets surveys on social maps;
- health mapping, where the health and welfare status of each farming member is marked on or by each house using coloured stickers or other markers; categories might include cases of TB, malnutrition, ear infection, handicapped, post/ante-natal mother, jaundice, does or does not visit primary health care centre, family planning operations and so on. Generally the chronically ill are invisible, but with this method of health mapping we know where they are.
- topical maps, such as aquifer maps drawn by the local water diviner, soils maps by soils experts, irrigated fields' maps by tank controller, etc;
- impact monitoring maps, where villagers record or map pest incidence, input usage, weeds distribution, soil quality etc; some of the most illuminating maps and models combine historical views with those of the present and future. In one case a model of a catchment showing today's situation was compared with one for 20 years past and 10 years in the future. At most sites maps or models are constructed by different interest groups within a community, as these will represent their particular interests, eg. men and women, old and young, poor and wealthy etc.

5. ***Transect Walks and Participatory Transects***

These are systematic walks with key informants through the area of interest, observing, asking, listening, looking, identifying different zones, seeking problems and possible solutions. The findings can be mapped on to a transect diagram. There are many different types of transects - vertical, loop, combing, nullah, tank, sweeping etc. Most transect walks result in the outsiders discovering surprising local practices, such as indigenous soil and water conservation practices, multiple uses of wild plants, great numbers of varieties of crops etc.

6. ***Seasonal Calendars***

Explore seasonal constraints and opportunities by diagramming changes month by month throughout the year. Use ceremonies as a cross-check that names of months are in common, and ask people to use pieces of stick, draw histograms in the dust or with chalk or make piles of stones, seeds or powders to represent relative quantities and patterns of rainfall, soil moisture, crops, livestock agricultural and non-agricultural labour, diet, food consumption, illnesses, prices, animal fodder, fuel, migration, pests, income, expenditure, debt, children's games and so on. Seasonal calendars can be drawn in linear fashion with 12 months to show a typical year or 18 months to illustrate changes between year; or can be drawn in a circle.

7. ***Activity Profiles and Daily Routines***

Explore daily patterns of activity through profiles and routines, Chart for each hour of the day typical activities, amount of effort, time taken, location of work. Compare for different people eg. men, women, old, young; compare profiles and routines for different seasons.

8. ***Semi-Structured Interviewing***

This is guided interviewing and listening in which only some of the questions and topics are predetermined, and questions arise during the interview. The interviews appear informal and conversational, but are actually carefully controlled and structured. Using a guide or checklist the multidisciplinary team poses open-ended questions and probes topics as they arise. New avenues of questioning are pursued as the interview develops. The output is usually in the form of hypotheses and propositions, but can also be in quantitative form.

9. ***Types, Sequencing and Chains of Interviews***

There are many types of interviews that may be combines in sequences and chains:

- Key informant interviews - ask: who are the experts? This is so often overlooked. Put together a series of interviews with key informants of a different stage of a process (eg. men on ploughing, women on transplanting and weeding, shopkeeper for credit and inputs etc).

- Group interviews. These may be groups convened to discuss a particular topic (focused or specialist groups); groups comprising a mix of people whose different perceptions illuminate an issue (structured groups); casual groups met, say, at a tea shop; community and neighbourhood groups. Most participatory diagramming is with groups - the maps, calendars etc. provide the focus for discussion. Group interviews are often powerful and efficient, yet in the past have often been neglected.

10. ***Permanent Groups***

Formation of groups with a common interest, eg. farmer's groups or panels growing a similar crop or all having fields in a micro-watershed; credit groups; issues groups of farmer contributing to a particular nullah, etc. These often take several meetings to make clear to farmers that they are a group with a common interest.

Plate 9. Participatory mapping of Jagathap village: male villager pointing out details to scientists (see Figure 1 in Paiyur report)
Photo: Jules Pretty

Plate 10. Participatory mapping of Jagathap village: female and male villagers pointing out details to scientists (see Figure 1 in Paiyur report)
Photo: Jules Pretty

12. *Local Histories*

Detailed accounts of the past, of how things have changed, particularly focusing on relationships and trends. These include technology histories and review - outsiders cannot be sure that technologies will always be useful, crop histories; livestock breed histories; labour availability; trees and forest histories; education change; population change. Folk lore, songs and poems are valuable resources for exploring history.

13. *Local Researchers and Village Analysts*

More and more local people are taking an active role in analysis and presentation. Village extensionists conduct complete participatory analyses with no outside help; villagers conduct transects, interview other villagers, draw maps, observe and produce plans. Other potential researchers include school teachers, students, poor etc.

14. *Venn (or Chapatti) Diagrams*

Use of circles to represent people, groups and institutions. People arrange these to represent degree of real overlap. Innovations include drawing lines between circles and village circle, with thickness of line representing strength of relationship; or representing strength by distance from the centre.

15. *Participatory Diagramming*

Over and again people have shown their capacity to understand and produce pie diagrams, bar charts, flow diagrams etc. using seeds, fruits, stones on the ground as well as pens and paper. Topics for pie diagrams might include conflict sources; contribution to livelihoods of common property resources; crop mixes etc. As for all other diagramming it is essential to repeat with informants representing different interests, such as men and women, old and young, wealthy and poor.

16. *Wealth Rankings*

A range of methods to identify groups or clusters of households according to relative wealth or well-being. Informants sort a pile of cards or slips of paper, each with one household name recorded on it, into piles. The wealthiest are put at one end, the poorest at the other, and as many piles as desired are made. The process is repeated with at least three informants. But a quicker method is to conduct the ranking directly onto a social map. The social maps are also helpful in acquiring a complete list of households. Villagers are then asked to indicate on the houses the relative wealth classes. These are coloured for easy identification. Individual assets can also be marked for each household, such as land ownership, animals, tools etc. There have been no apparent problems with confidentiality - an issue dominating the former method. Wealth rankings are useful for:

- leading into other discussions on livelihoods and vulnerability;
- producing a baseline against which future intervention impact can be measured;
- providing a sample frame to cross-check the relative wealth of informants who have been or will be interviewed. Biases against the poor and vulnerable can thus be offset;

Plate 13. Social mapping of Bharathi Nagar harijan colony (see Figure 18 in Aruppukottai report and Appendix C3)
Photo: Jules Pretty

Plate 14. Wealth ranking of households in Bharathi Napar into four classes (see Figure 19 in Aruppukottai report in Appendix C3)
Photo: Jules Pretty

Plate 15. Matrix scoring of herbicide treatments by agricultural scientists at Aruppukottai Regional Research Station
Photo: Jules Pretty

Plate 16. Matrix scoring of cotton varieties by farmer attending workshop at Paiyur Regional Research Station
Photo: Jules Pretty

Plate 17. Matrix scoring of five rice varieties by a farmer of Jagathap village (see Figure 15 in Haiwai report)
Photo: Jules Pretty

Plate 18. Matrix scoring of five tree species by a farmer of Appanaickenpatty village (see Figure 11 in Aruppukottai report)
Photo: John Devavaram

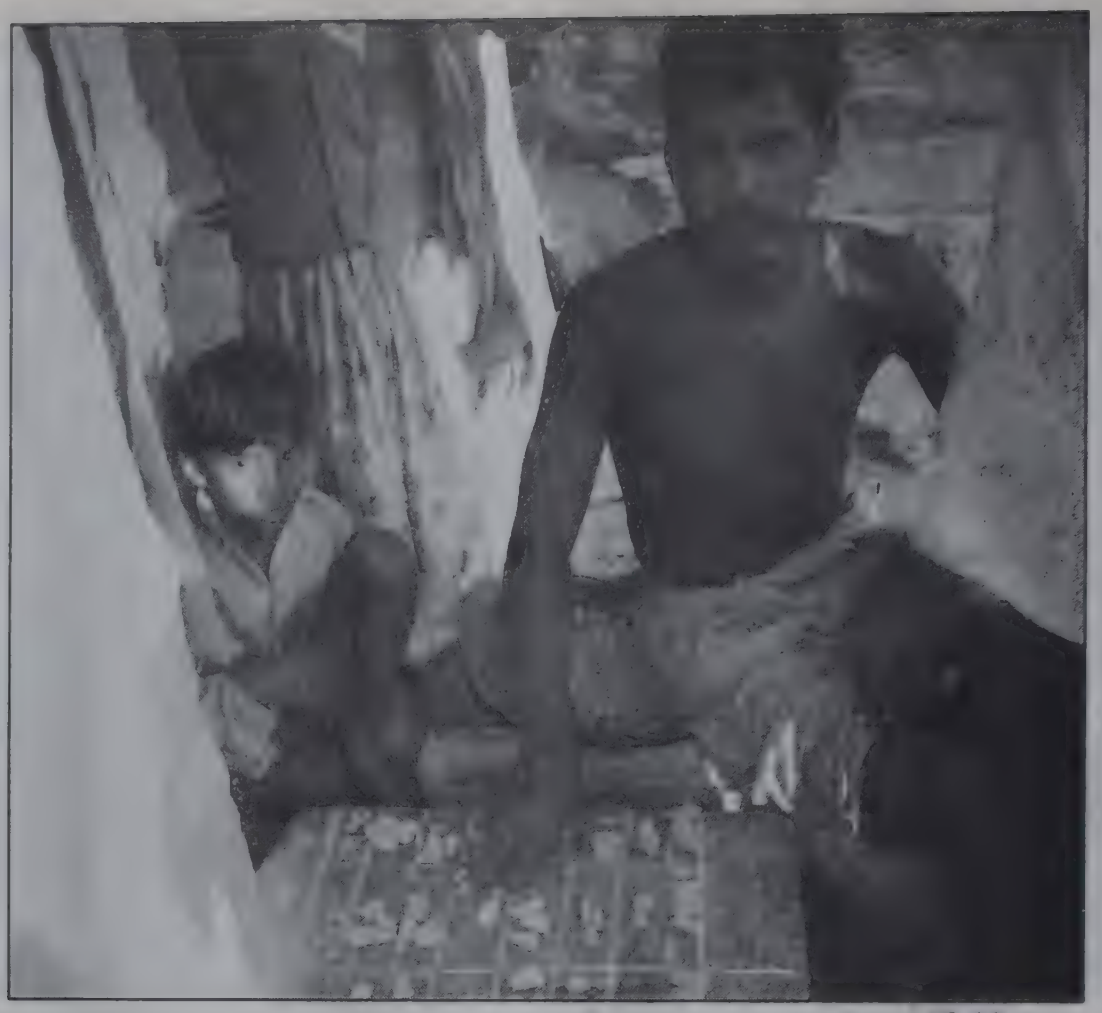


Plate 19. Matrix scoring of five rice varieties by a farmer noted locally for his knowledge on rice, Kalkurichi village (see Figure 40 in Aruppukottai report)
Photo: Jules Pretty

Plate 20. Matrix scoring of livelihood opportunities by young women and men of Kalkurichi village (see Figure 37 in Aruppukottai report)
Photo: Jules Pretty

- producing key local indicators of welfare and well being. Ask participants how someone can move from one group to another. How do local indicators vary from outsider measures of wealth and poverty?

17. ***Direct Matrix and Pairwise Ranking and Scoring***

These versatile methods confirm their value for learning from local people of their categories, criteria, choices and priorities. For pairwise ranking items of interest are compared pair by pair, informants being asked which is preferred of the two, and why. What is good and bad about each? Matrix ranking and scoring takes criteria for the rows in a matrix and items for columns, and people fill in the boxes for each row. The items may be ordered for each of the criteria (eg. for 6 trees - which is best to worst for fuelwood, fodder, erosion control, fruit supply etc); or participants may put in piles of stones, seeds, berries for semi-quantitative scoring.

18. ***Matrices***

Matrices are useful for ordering and structuring information gathering and planning. They include:

- attributes matrices for technologies eg. dams and catchment structures along the top and attributes down the side;

- problems - opportunity matrices, with column headings including, for example, local name for zone, local name for soil, soil type, cropping pattern, problems resources available in village and lastly possible solutions;

- manual discriminant technique matrices for contrast comparisons. Ask group a why group B is different or does something different. For example, set up three groups of high, medium and low maize yielding farmers, and ask why they get the yields they get, and why other get theirs. Record they key findings in a matrix;

19. ***Inventory of Local Management Systems and Resources***

Local people know their area best, and have evolved their own systems of management. Focus on how they manage water, trees, credit, etc. Use local classifications where possible - these are often more diverse than those used by outsiders. Every village has its local taxonomy and classifications.

20. ***Portraits, Profiles, Case Studies and Stories***

Brief summaries of a household's history, a farm coping with crisis, how a conflict was resolved etc; short, colourful descriptions of situations encountered by the team; stories recounted by local people.

21. ***Key Probes***

These are questions that can lead directly to key issues, such as "suppose my buffalo enters your field and eats your crop, what do you and I do?"; "what do you talk about when you are together?"; "what new practices have you or others in this village experimented with in recent years?" Report for different informants/participants, and compare.

22. ***Folk-lore, Songs and Poetry***

Always in local language using local terminology. Reveals a great deal about values, history, practices, who knows and who does not.

23. ***Futures Possible***

How would you like things to look in the year's time? What will happen if nothing is done, if something is done? Exploration of desires, wishes and expectations can also be explored on maps, models and other diagrams.

24. ***Team Contracts***

Pay great attention to the group dynamics of the team. Change team mixes, hold evening discussions and morning brainstorming sessions. Make a play on "who holds the stick, pointer, pen, chalk, umbrella". Outsiders who hold the stick talk and don't listen. Elect one person to monitor team interactions during a group interview or discussion to provide feedback further to provoke attitude changes in outsiders. They should record the location of each person, and record interactions by:

- drawing a circle around each person when they speak; break the circle if they are interrupted;
- drawing an arrow from talker to person being talked to, with duration of speech recorded in seconds
- record each contribution in seconds and put a circle around the number if interrupted.

The results are used simply for illustrating to team members what has happened during the discussion. It is visually clear who has dominated, who has been quiet, who was always interrupted, etc.

A key method used to develop the team contract is the *Problem Solving* Exercise (see Box 3).

25. ***Diagrams Exhibition***

Before group meetings to discuss analysis and planning put diagrams up on a wall in a public place for all to see. When they attend the meeting they will know partly what to expect.

26. ***Slide Inventories***

Take photographs of participatory fieldwork, and keep for presentations. Plan a slide programme for villagers by taking projector and show what has happened in other participatory analyses. Encourage cross-connections between different villages.

27. ***Shared Presentations***

The findings are presented back to villagers and outsiders. Best if done by villagers themselves. Another opportunity for cross-checking and feedback. Outsiders stand up, present, and invite comment and criticism - a reversal of roles. Essential that outsiders concentrate upon both presentation and analysis of who contributes. Elect two people to record group interactions. Who

Plate 21. Venn diagram of institutions in Appanaickenpatty village (see Figures 3 & 4 in Aruppukottai report)
Photo: John Devavaram

Plate 22. Semi-structured interviewing of a farmer in Kalkurichi village using sensitive body language, small notebook and shared visualisation in notebook.
Photo: Jules Pretty

Plate 23. Seasonal labour calendar by livestock farmer in Kalkurichi village (see Figure 25 in Aruppukottai report)
Photo: Jules Pretty

Plate 24. Seasonal calendar of cropping in drylands and irrigated lands, Kalkurichi village (see Figure 24 in Aruppukottai report)
Photo: Jules Pretty

Group Problem Solving and Team Contract Exercise

Group 1: What would you do if.....

- In a small group interview the informants are very silent, unresponsive and reluctant to answer your questions?
- *During the matrix ranking and scoring, the more articulate and better dressed male farmers dominate the discussions about local farming priorities?*
- Part way through a small group interview some farmers say they must leave to attend to other matters?
- *A member of your PRA Team is "late again" in the morning and the other team members are irritated?*
- A PRA team member is over-enthusiastic and keeps interrupting the farmers when they are speaking?
- *On the final day of the PRA important new information arises which contredicts an earlier "key finding?"*
- Towards the end of the day you meet a farmer who knows a great deal about experimenting on crops, but some of your team members are too tired to interview that person and would rather return home?

Group 2: What would you do if.....

- A farmer calls you over as you are walking back to the vehicle, looking forward to having something to eat?
- *In front of a group of farmers, one of your PRA team members contradicts what one of the farmers has just said?*
- One PRA team member is frequently giving negative criticism in team discussions?
- *You realise by the end of the second day that very few women have been interviewed, although they appear to be actively engaged in farming activities in the catchment?*
- One of your PRA team members wishes to leave the day before you complete the fieldwork?
- *A very senior member of staff of your organisation wishes to attend the fieldwork to observe the participatory methods but, as he knows little of the attitudes required for good participation, you fear he will simply lecture the farmers?*
- The information you collect during the PRA seems to contradict your secondary data sources?

talks? Who interrupts whom? Whose ideas dominate? Who is different from everyone else? Who lectures? Outsiders must concentrate in listening and facilitating. Not lecturing.

28. ***The Night Halt***

All interactions between outsiders and villagers are facilitated by staying in the village - the night halt. Many organisations have made this an essential part of participatory analysis and planning. It provokes change in outsiders' attitudes - they sleep and eat as villagers do; it allows for early morning and evening discussions when people are less busy; and it is a explicit indication of commitment by outsiders to the village and village life.

29. *Questionnaires*

If necessary, these must be short, not conducted early in the process, and preferably tied to a focused issue. Best if light, late and tight.

30. ***Report Writing in the Field***

This is easier said than done. But it is essential to record as a team the key findings before dispersal of members to their own organisations, and before arriving back at your desk where other priorities dominate. Report writing is made easier by;

- writing a brief summary of each diagrams;
- writing up the process in diary form.

31. *Self-Correcting Notes and Diaries*

Keep a private diary or series of notes to focus on where you, the outsider, would desire things to go better next time. Where were the problems? What could be done to avoid them? Who might be able to provide some solutions?

32. *Survey of Villagers' Attitudes*

Ask for the villagers' view on why the outsiders' team is in their village. In one participatory rural appraisal in Bihar some thought the outsiders were bringing a factory, building irrigation systems, making a film, and prospecting. This helps to ensure outsiders are explicit about their work and motives.

33. *Intriguing Practices and Beliefs*

These are focused on before and during PRA to make explicit that rural people have much to say to outsiders on indigenous practices, but these may not necessarily fit into conventional scientific thinking. There may be no explanation, but it is important to record them without judgement.

Plate 25. Vice Chancellor of Tamil Nadu Agricultural University, Dr S. Jayaraj, visiting PRA team in the field
Photo: Jules Pretty

Plate 26. Timeline of changes in cropping patterns of Appanaickenpatty village (see Figure 9 in Aruppukottai report)
Photo: John Devavaram

Plate 27. Sequence of five photographs demonstrating change in group dynamics as agricultural scientists shift from interviewing to participatory analysis of labour patterns on ground (see Figure 25 in Aruppukottai report). I: The interviewing
Photo: Jules Pretty

Plate 28. Sequence. 2: PRA team member begins visualisation on ground
Photo: Jules Pretty

Plate 29. Sequence. 3: Farmer squats on ground
Photo: Jules Pretty

Plate 30. Sequence. 4: Farmer and team members make sequential adjustments to the first calender
Photo: Jules Pretty

Plate 31. Sequence. 5: The closed group of three farmers and three scientists
Photo: Jules Pretty

APPENDIX F: ARTICLES BASED ON PRAs CONDUCTED AT ARUPPUKOTTAI AND PAIYUR

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1. MEASURING AGROECOSYSTEM PROPERTIES: ADAPTATION OF MATRIX SCORING TECHNIQUE

M. Shanmugam, A. Palchamy, S. Jeeva, A. Kumar and K C John

in collaboration with

Mrs. and Mr. Marappan,
Kumbrahalli Village, Dharmapuri District,
Tamil Nadu, India

in RRA Notes volume 17 (1992), forthcoming

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2. RESOURCE FLOW - VENN DIAGRAMS: A TWO-IN-ONE APPROACH

K. Natarajamoorthy, C. Chinnusamy, P. Nasuredeen,
R. Ganeshan, N Shanmugavalli, V.T. Sakunthala, Janardhana Rao

in collaboration with

Rama Gounder
A Farmer from Dharmapuri, Tamil Nadu

in RRA Notes volume 17 (1992), forthcoming

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3. FINDING THE POOREST IN A TAMIL NADU VILLAGE: A SEQUENCE OF MAPPING AND WEALTH RANKING

Jules Pretty, S. Subramanian, N. Kempuchetty,
D. Ananthakrishnan, C. Jayanthi,
S. Muralikrishnasamy and K. Renganayaki

in RRA Notes volume 15 (1992), 39-42

1. MEASURING AGROECOSYSTEM PROPERTIES:

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This note is based on the adaptation of matrix scoring technique to investigate local perceptions of agroecosystem properties, namely productivity, stability, sustainability and equity, in a recently concluded PRA workshop in Paiyur for scientists of Tamil Nadu Agricultural University, India.

Matrix Scoring

Variants of matrix rankings and scoring are used to understand farmers' decision making processes, comparing preferences for different technological options, land use strategies, etc. between individuals and between different groups, and eliciting decision-criteria. However, its efficacy in discerning long-term performance of farming systems is yet to be explored systematically. We describe a simple, quick and informative method of exploring trade-offs among systems properties in a drought-prone region.

Sequencing With Other Techniques

Informal discussions along the transect walk helped us to understand the indigenous classification of the village ecosystem into several micro-environments, such as: *Manal Kollai* (ecological niche with sandy soil), *Semman* (red soil niche), *Kollamedu* (upland), *Pallam* (lowlying region), *Kutta kollai* (a small intensively cropped land), and *Thoppumedu* (upland grove).

Participatory mapping/modelling exercises with different groups of villagers, ie. children, women and men not only confirmed the local land type classification but also gave us a rationale for land use systems in a drought prone village. Seasonal analysis and probing of risk coping mechanism provided us with a list of local innovators.

Marappan and his wife have been experimenting successfully to build diversity in their farming systems as a risk-hedging device. Diversity is marked by the wide variation in species choice, planting, cultural and harvesting practices and infinite adaptations to seasonal variations in their 7 plots. His agroforestry system comprises coconut and cotton, coconut and sugarcane, mango and rice, mango and groundnut, four cattle, and annual crops like blackgram, greengram, lab-lab, Indian finger millet, tomato, chilly, rice, groundnut and sugarcane. Their latest experimentation is on integrating cassava into the system.

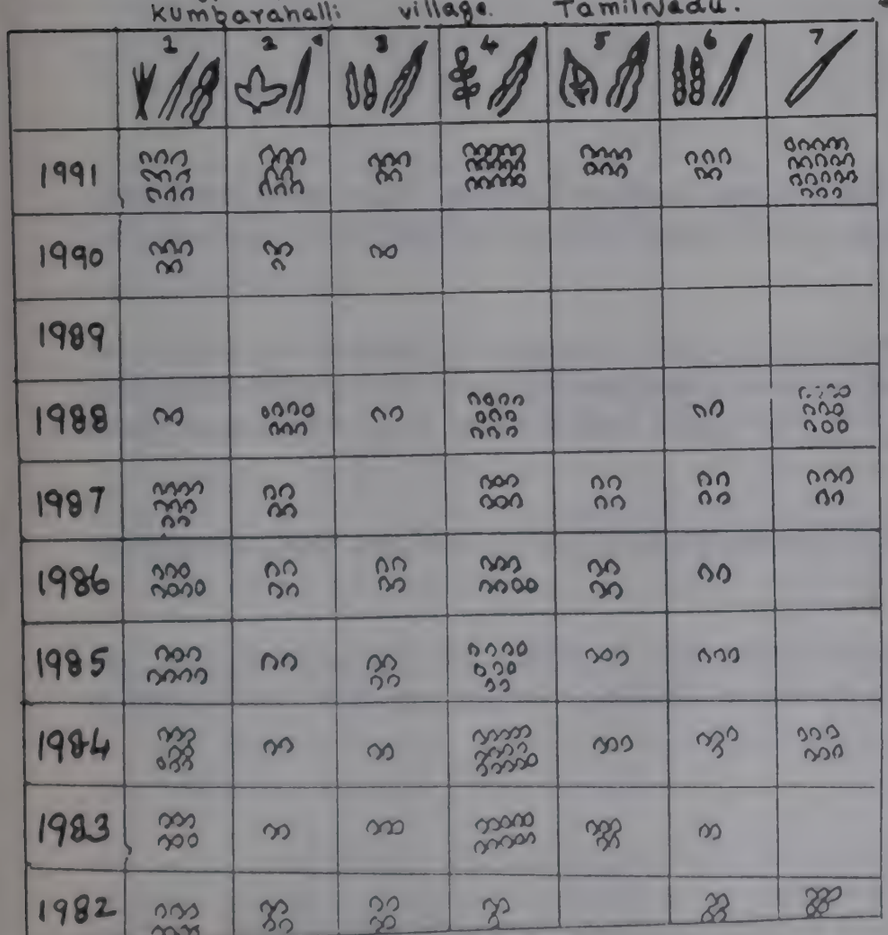
Farm profile, resource flow and nutrient flow maps constructed by the couple enabled us to appreciate their resource endowments, physical facilities, enterprise preferences for different plots access to institutions for resources such as: technological information, mechanical energy, crop seeds and nutrients, credit and markets for disposal of marketable surplus.

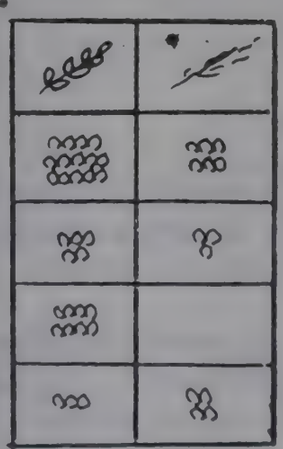
Encouraged by couple's willingness to share their time in experimenting with various participatory methods, the next day we found ourselves once again on their doorstep. The farm maps were not disturbed. We spent some time trying to obtain their views on the virtues and drawbacks of different crops and tree species combination. Subsequently, we tried to assess the long-term performance of crop-tree-livestock systems that the Marappans have developed over the years.

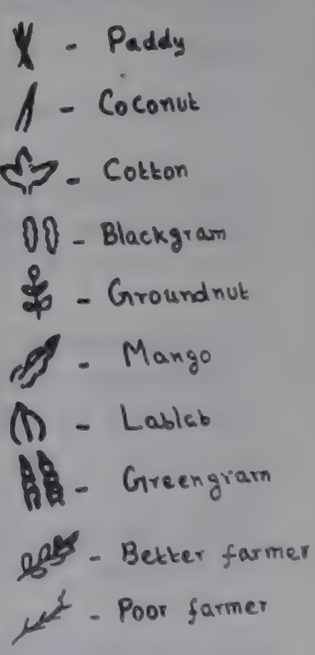
They used leaves of different crops and trees occupying the plots to form columns that identified the seven plots. Years (written on cards) starting from the most recent to distant past, formed the ten rows. A 7 x 10 matrix was constructed with the help of rangoli powder. Flowers of Pannai keerai (*Celosia argentea* Linn.)- a widely growing weed, its leaves are used a spinach -from adjacent field were collected for scoring productivity in 70 cells.

We were all struck by just how easily the Marappans could fill up the cells row by row starting from the immediate past and the sense of satisfaction that they showed on completion of the scoring. Finally, we asked whether similar scoring can be done for comparable plots of a rich and a poor farmer. Mr Marappan constructed a new matrix - 2 x 4 this time - and confessed that he could not compare realistically over all the years (see Figure A).

MATRIX SCORING ON PRODUCTIVITY OF A FARMING SYSTEM. Kumbarahalli village. Tamilnadu.







The flowers of Panna: Keera: weed was used for matrix scoring.

Interviewing the Matrices

The focus of interviewing shifted to the two matrices now. We continued exploring climate-induced variability - inter-year, inter-plot and inter-farmer - and risk management strategies employed by different groups of farmers. The emergent analyses were as follows:

1. *Preferred Tree-Crop Species Combination*
Mango - groundnut combination was preferred over other combinations because it provided consistently a high cash income, except the worst year.

Coconut - mango - paddy combination was second in preference because besides providing rice and coconut for domestic consumption, it also provided marketable surplus of coconut and mango. That is, it combined personal use and income.

Coconut - cotton was preferred over remainder of the options evaluated because income is quicker.

Longer gestation period of coconut compelled Marappans to experiment with several crop combinations both in the earlier stages of life and later after stabilised yields were obtained. For instance, in 1982 and 1984, in plot no. 7, they successfully grew sugarcane as an intercrop and thereby received higher income.

The farmer family could not reveal preference among mango-blackgram, mango-greengram and coconut - greengram. The annual rainfed crops that combined personal consumption and cash inflow, were also vulnerable to climatic fluctuations.

Coconut, though most profitable, is also most vulnerable to drought conditions. It took three years for the palms to recover from the worst drought of 1989. Mango trees proved hardy and withstood the moisture stress.

2. Inter-year Comparisons

The farm family indicated that 1992 was the best year in the past decade. Other good years were: 1984, 1986 and 1988. Marappan recollected that 1975 and 1980 were relatively better years in terms of productivity in the last two decades.

The couple agreed with others that 1989 was the worst year. Villagers remembered this year for the acute shortage of drinking water. None of the seven plots provided any income and the Marappans had to draw on their previous savings. Mrs. Marappan's regular salary as a school teacher stood them in good stead.

1982, 1983 and 1985 were moderate years because the farm family could just meet consumption requirements.

The monsoon behaved erratically in the post-drought year, ie. 1990. The pre-monsoon rains were timely, but withdrew early. Subsequently, the farmer could not complete sowing of annual crops in all the plots.

3. Inter-plot Comparisons

The farmer preferred trees as the pivotal crop to experiment with alternate farming systems. In three plots each mango and coconut were raised as stand-alone trees, while on one plot both the species

were combined. Mango (18 x 18 feet) and coconut (30 x 30 feet) trees have sufficient spacing of experimenting with several intercrops successfully.

Plot 7 (coconut alone) was intercropped with sugarcane in 1982 and 1984. Coconut started fruiting in 1987.

4. Inter-farmer Comparisons

The Marappans identified relatively a well endowed and a poor farmer with plots comparable to their plot no. 2.

Climatic variability affects all the farmers similarly. But coping mechanisms vary according to the managerial ability. For instance, the better farmer coped with the drought years by relying on off-farm activities. He had a fertilizer distribution outlet among other things. The fertiliser purchase decisions are usually made at the time of sowing and hence he could derive sizeable income even in the worst year. In the post-drought year, ie. 1990, farmers are known to vigorously pursue production maximisation strategy. Initial good rains enabled the fertiliser dealer to offload significant quantities of nutrients. Though early cessation of rains affected his business.

The weaker farmer migrated temporarily to city as wage-labour during 1989, while the Marappans drew down their savings. However, small scale operation enabled the smaller farmer to cultivate his plot intensively in the post-drought year, ie. 1990, as compared to the Marappans.

Sustainability Analysis

Matrix scoring and its examination led us to sustainability analysis. The farm family has successfully experimented with diversity in agriculture and food habits. The choice of enterprises portfolio has been influenced by personal use and steady flow of cash income.

Inter-year climatic fluctuations induced the farm family to experiment with enterprise combinations with different levels of productivity and availability potential but the flowering and fruiting patterns are significantly affected by the climatic variations. Whereas, mango has more or less a stable production pattern.

The tree-tree and tree-crop combinations in the farming systems has enabled the farmer to withstand ecological perturbances. The matrix scoring reveal that the system has a high degree of sustainability. The system returned to its high level of equilibrium in the post-drought years. The enterprise combination has also contributed to the stability of the system. Recognising the high water requirement of coconut palms immediately following the drought, the Marappans efficiently utilised the limited water resources by intercropping tree stands with rice, with a basin irrigation system. Thus the farm family has been able to combine crops with trees as the pivot, synergistically.

The output indicators of the farming systems as indicated by the farm family are: produces from a wide range of crops, trees and livestock; by-products such as, groundnut oil cakes that is used both as cattle feed and manure, tree leaves for feed and manure and the farm yard manure. Most of the by-products are recycled within the farm.

The impact indicators of sustainability emerging from the analysis are: ability to cope with the worst drought without resorting to asset depletion or seasonal migration, ability to generate investible

surplus, the relatively a good standard of living.

Reflections on Exercise

- We have experimented with the adaptation of matrix scoring to get a handle on agroecosystem properties with an innovator farm family (wife-husband team). It has worked well.

  The trade-offs among agroecosystem properties in a given recommendation domain can best be evaluated if similar exercises are conducted with different farm families and groups. Groups have the advantage of providing multiple interpretations of scoring and variations in conflict resolutions through arguments and counter arguments. We also need to test whether mixed groups of women and men from different households would provide better insights to conflict resolution mechanisms.

- Sequencing of activities and a relaxed approach to collaborative exploration is a pre-requisite to understand the sense-making behaviours of farm family. It is tempting for professionals to extract information on what they think to be important issues. But such behaviour often is counter-productive and does not enable researchers/extentionist to learn from the farmer. Participants - both agriculturalist and professionals - can learn through the scoring and the subsequent discussions. Besides explicit articulation of preferences and criteria, it also enables to check ones assumptions about the farming systems performance.

- Scoring of any kind involves implicit weighting. Inter-year, inter-plot and enterprise combination confounds the issue. It warrants further probing.

2. RESOURCE FLOW - VENN DIAGRAMS: A TWO-IN-ONE APPROACH

K. Natarajamoorthy, C. Chinnusamy, P. Nasuredeen,
R. Ganesan, N Shanmugavalli, V T Sakunthala, Janardhana Rao

in collaboration with

Rama Gounder
A Farmer from Dharmapuri, Tamil Nadu

in RRA Notes volume 17 (1992), forthcoming

Farmers' flow diagrams are good descriptors of important patterns of flow and transformation of resources - money, materials, energy, information, etc. A farmer's strategic choices is best understood by means of decision trees, whilst circles of different sizes and colours have become popular in representing individuals, groups and institutions that have significant bearing on farmer's critical decisions. In this brief note we describe a recent innovation in method by Rama Gounder, a farmer collaborator, to help researchers learn about mediating variables influencing his decisions on crop selection, decision to purchase or use home grown inputs, and resource allocation decisions.

In a recently concluded PRA workshop at Regional Research Station of Tamil Nadu Agricultural University at Paiyur, Rama Gounder and several other farmers - both he and she - acted as village teachers. They were involved in transect walk, mapping/modelling exercises, seasonal analysis, ranking and scoring, and resource flow diagramming - the tools that outsiders have found useful in learning about the villagers' perception and analysis of their environment.

On the fourth day, while we were probing farmer's critical decisions on crop selection and resource allocation, Rama Gounder proceeded, after his initial explanation, to show his ingenuity in analysing and explaining his decision making process.

Besides using the cards and chapatti circles of different sizes and colours that the researchers had carried to the village, Rama Gounder involved the children to collect specimen of crop plants, leaves, seeds, etc. and used samples of gypsum block, fertilizer farm yard manure (FYM), currency bills of different denominations, cartons of *Azospirillum*, pesticide cans and package of recommendation booklets to symbolically represent resources, their flows and transformation in different plots, his resource allocation decisions, and institutions having significant impact on his decisions.

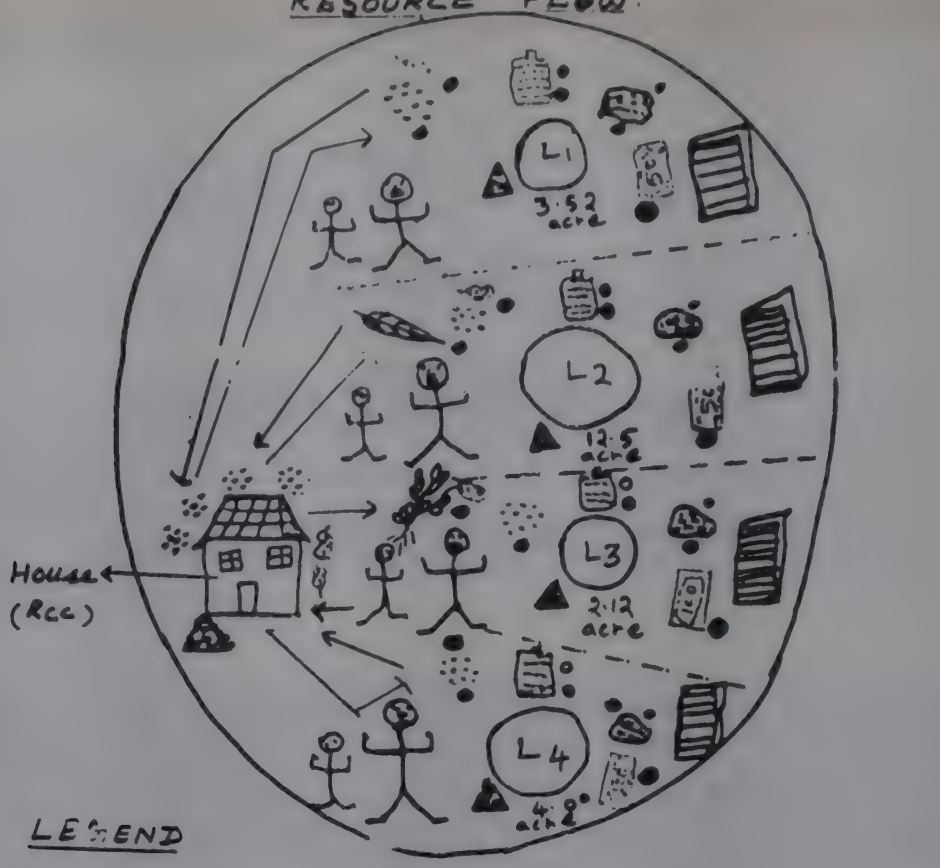
Analysis of Process

The different activities of his analysis were as follows:

1. He drew a large circle on the ground to represent the village boundary using rangoli

2. On a large drawing card he drew a symbol of his house and place it to represent the dwelling place in the village.

VENN - FLOW DIAGRAM SHOWING AGRI. RESOURCE FLOW.



3. Internal inputs like FYM, seeds of paddy, pulses, groundnut, etc., were symbolically represented by placing small samples of each input around the house cutout.

4. Rama Gounder divided the circle into four parts by drawing thin line. This represented his four plots, which he identified by writing the plot names on large paper circles. Plots nearer the habitat were shown nearest to the house, while the farthest plot was put on the top, away from the house.

5. Crops grown in different plots were shown by the seeds, leaves or plant specimen.

6. Next, the farmer placed samples of inputs used in different crops, sample lot being proportional to the quantity used. Pesticides cans represented the chemical inputs sprayed to the crops. Gypsum rocks of different sizes exhibited the soil amendments used while, fertilizer samples and FYM heaps were used to explain his nutrient management practices. Currency bills of different denominations emphasized the differential credit requirements for raising crop combinations in the plots. A packet of Azospirillum typified the usage of bio-fertilizers like Azolla and Azospirillum. Thus, all the resources allocated in the plots were symbolically represented.

7. Rama Gounder now addressed himself to the issue of institutions that influence his resource allocation decisions. He employed circles of different colours and sizes to indicate agencies such as, private shops, input depots run by the State Department of Agriculture, Co-operative bank, Adhiyaman Grama (Rural) bank, Regional Research Station, Paiyur, Extension Office and his own house. The size of circle denoted the significance of different institutions. The circles were placed around the inputs.

8. On a little prodding from us, Rama Gounder used cut outs of human figure of two colours to differentiate between the family and hired labour and placed them on the four plots. Larger cut outs were used to suggest greater labour requirements.

9. Finally, on a large drawing sheet he spelt out the legends.

Reflections

We were all struck by Rama Gounder's innovativeness and the felicity with which he analysed his own environment and the decision making process. It was evident that farmer's decisions on enterprises selection is influenced by the micro-ecological niches available to him and the access to and the assurance of institutional support.

Farmer can play an important role in methodology development, provided we the professionals are willing to set apart time to listen to and allow him to teach us what he knows and practices best.

Instead of requesting villagers to name the institutions they interact with regularly and then try to understand their spheres of influence, the exercise suggests that farmers should be encouraged map out critical decisions and then identify departments/agencies bearing on such decisions. In the present case, crop enterprise selection and resource allocation decisions were the focal interest. However, the exercise may be relevant for other areas too, such as, health, credit education, etc.

Once the basis of farmer's interactions with different institutions are established, different scenarios of resource management and the requisite institutional support can also be probed.

It will be interesting to examine how a group will handle open-ended exploration.

3. FINDING THE POOREST IN A TAMIL NADU VILLAGE: A SEQUENCE OF MAPPING AND WEALTH RANKING

Jules Pretty, S. Subramanian, N. Kempuchetty,
D. Ananthakrishnan, C. Jayanthi,
S. Muralikrishnasamy and K. Renganayaki

in RRA Notes volume 15 (1992), 39-42

This short piece reports on exercises conducted over two days in Kalkurichi village near Aruppukottai. It describes a sequence of participatory social and resource mapping exercises combined with wealth ranking that enabled us to discover the poorest people in the village.

The main lessons for us were that PRA methods reveal hidden complexity and can bring the poorest to the attention of investigators. But it is the attitudes and practice of the team that are critical. These methods revealed an apparent complete picture of wealth groups in the Harijan community, but it was only with persistent triangulation and probing that we found our original picture to be inaccurate. Good use of the PRA methods is not necessarily guaranteed by the methods alone.

Social Mapping and other Participatory Methods

We arrived at the village to find a bustling small urban centre. At first the team were nervous and walked through the lanes without interacting. By the end of the afternoon, the group was relaxed and laughing with other groups of local people. One sub-group started a social map with a group of women by asking one to draw a map of the village, so *"we can know about your place"*. They used different rangoli powders to indicate roads, canals, temples, cinema, shops, health centre, cooperative society, industry and housing. The group was joined by the rest of the team as they concluded interviews elsewhere. The numbers of local people involved also grew, and several people holding sticks made a series of sequential changes. The Harijan colony only appeared towards the end of the exercise and even then they were reluctant to add detail of paths and approach roads (Figure A). Individual houses were not marked as there were 1500 altogether. One old man said *"if we start marking all the houses, it will be dark by the time we finish"*. When the map was concluded, the team divided into separate sub-groups, one interviewing about the map, another producing seasonal calendars with a group of men, another with a group of women, another various pie diagrams. The methods and interviews flowed naturally and with great ease. At the end the teams set off on two transect walks, accompanied by groups of local people.

Transects and Seasonal Calendars

The team began the day with a review meeting from 0800 until 0945. This focused on what we had learnt the previous day, gaps, and methods proposed for today. We arrived at the village by 1020, and split into two sub-groups to proceed on transect walks. A range of interviews focused on livestock rearing, dryland farming, children and nutrition and labour patterns. During an interview with two farmers met while walking between fodder sorghum fields, one of the team members began marking the months of the year on the ground with a stalk. He then broke some stalks and laid them out to represent monthly labour demand as the two men commented on labour. Another

team member then squatted down to comment and point. One farmer then started to point at and comment on the diagram. Another man arrived along the path. All then squatted down together -3 interviewers and 3 farmers. Attention was now firmly focused on the calendar, and a series of sequential changes were made. Some of the sticks were lengthened, some shortened. The process was repeated twice, month by month.

Social Mapping and Wealth Ranking in the Harijan Community

Following further interviews and lunch, we decided to walk to the Harijan colony on the far eastern side of the urban area. This was *Bharathi Nagar*, the community missed off the previous day's social map until near the end of the "anything else?" prompting. We arrived in the colony and stopped by a lime kiln, near a large shady Prosophis tree. We already had a plan to produce a map, so the place near the path and by some irrigated vegetable fields was ideal. Getting started is always difficult. The process began with a group of only two young men. We asked them to mark their community, and one took the stick and started to draw in the sand under the tree. First the approach roads were drawn, then the lime kiln and tree, the temple, the fields, wells, trees, houses and drainage channel. As the men were drawing in the sand, the group grew to about 20 adults and numerous children in 10 minutes. The women took over with the rangoli powders, and the older men stayed on the fringes of the group. The women used pink for roads, blue for active wells, orange for dry ones and the temple, green for the fields, and yellow for the kiln. In the second phase, the men started to point and suggest changes. Tree leaves were added to show major tree species. Slowly those on the outside were drawn into the map making process, which was about 3x4 metres. An increasing number of people had rangoli powder on their hands. We asked them all to put a stone for each house, and everyone was very interested in putting their own house. The map became a focus for discussion about farming and farming techniques.

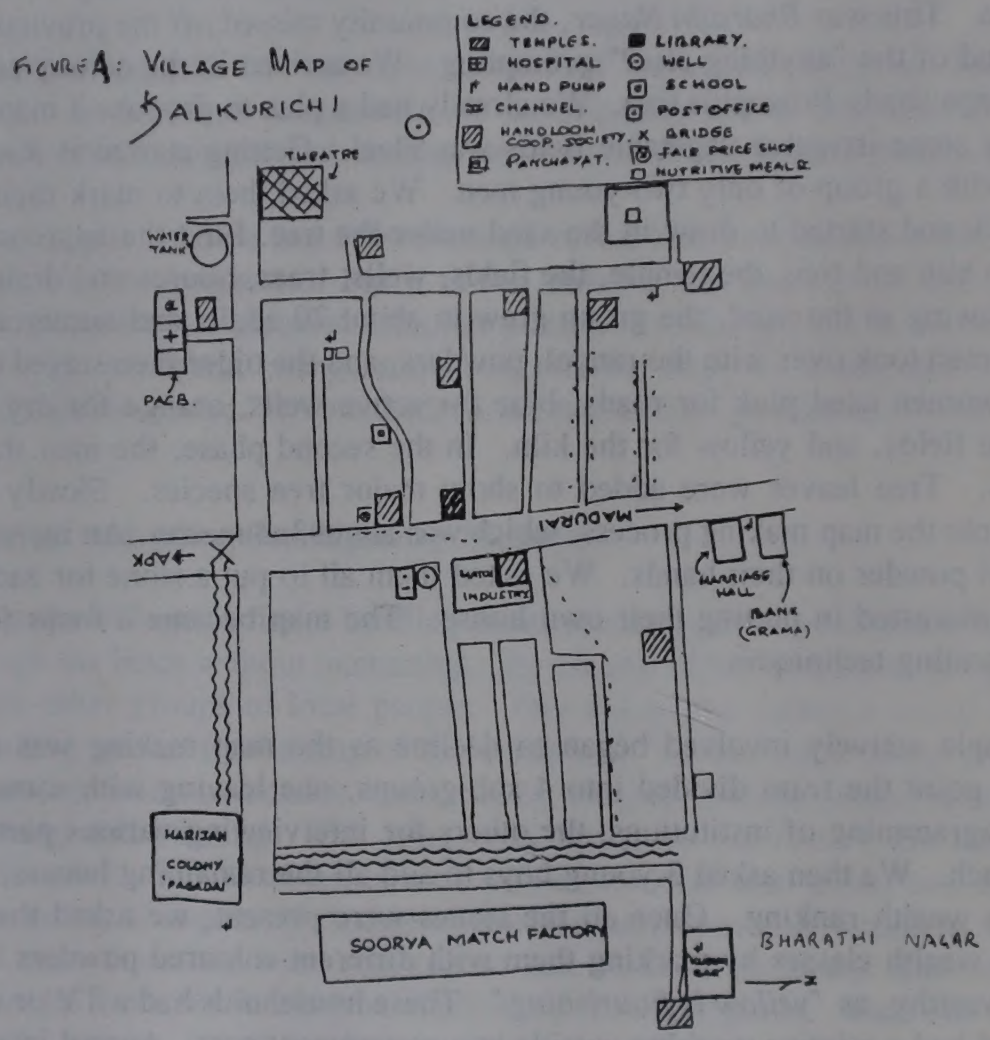
The numbers of people actively involved began to decline as the map making was drawing to a conclusion. At this point the team divided into 4 sub-groups, one leaving with some women and children for venn diagramming of institutions, the others for interviewing various parts of the map with 2 or 3 people each. We then asked 3 young boys to add all the remaining houses, with the aim of moving towards a wealth ranking. Once all the stones were present, we asked them to put the houses into different wealth classes by marking them with different coloured powders. They began with yellow for the wealthy, as *"yellow is flourishing"*. These households had a TV or radio, owned 2-3 acres of land, and had a relative working outside in a government post. Annual income was said to be of the order of Rs 2500. The second class was marked in pink - they had 1-2 acres, bullock carts and cattle, and an income of Rs 1500. The last group were green - the landless labourers earning less than Rs 1000 annually. There were 7 yellow, 10 pink and 29 green.

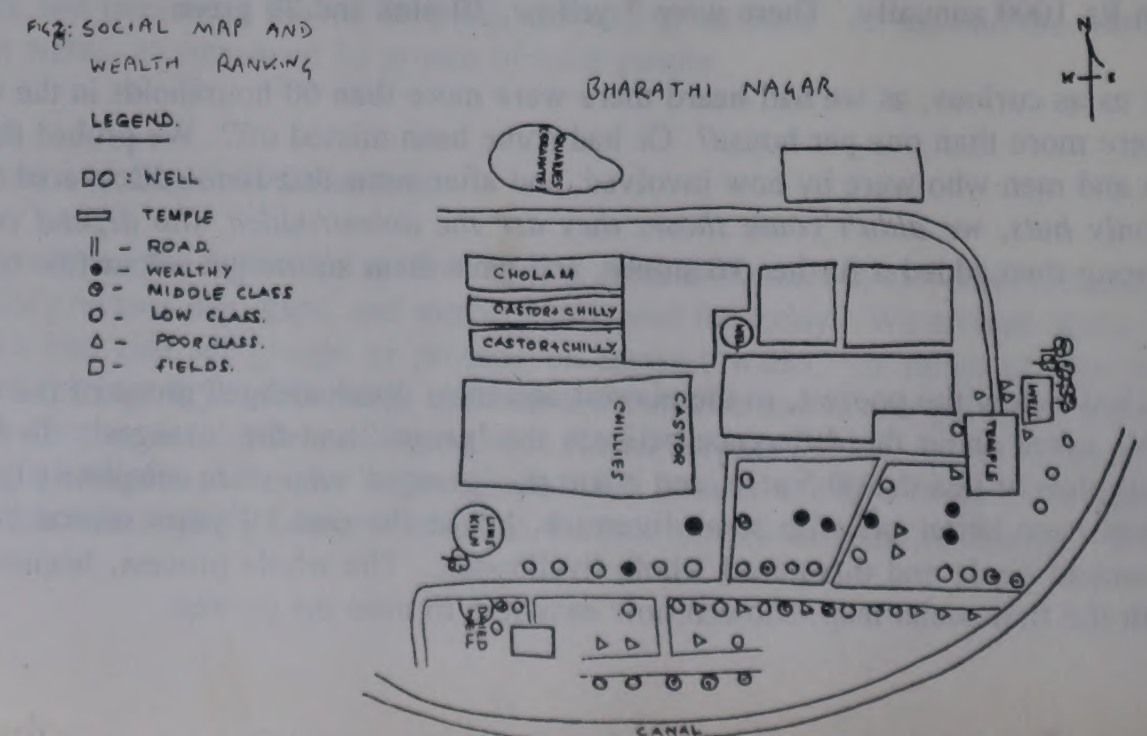
This then struck us as curious, as we had heard there were more than 60 households in the village. Perhaps there were more than one per house? Or had some been missed off? We probed the large group of women and men who were by now involved, and after some discussion discovered that the missing were *"only huts, we didn't count those, they are the downtrodden who depend on daily labour"*. The group then added a further 16 stones, and gave them an orange colour (the triangles in Figure B).

These were the class below the poorest, in the poorest and most disadvantaged group of the village, the Harijans. We asked about the difference between the 'greens' and the 'oranges'. In fact the 'greens' had small plots of less than 0.5 acre, and it was the 'oranges' who were completely landless. Many of these had been better off with some livestock, but in the past 10 years several bouts of disease had devastated herds and threatened whole livelihoods. The whole process, beginning the previous day with the first social map, showed how easy it is to miss the poorest.

This mapping and wealth ranking then led us to focus interviews on both on-farm and off-farm livelihoods, including visits to the match factory employing children and the weaving community. It was clear that a strategy for participatory agricultural research would have to take account of significant and rapid economic change as well as the different needs and perspectives of farmers and landless in the different wealth and caste groups.

Finding the poorest had not been easy, but the most important lessons we learned related to using sequences of methods to find the poorest and ensuring we do not give up too early.





TAMIL NADU AGRICULTURAL UNIVERSITY

Tamil Nadu Agricultural University is one of the 27 State Agricultural Universities in the country. Though it was established in June 1971, the Agricultural College and Research Institute, Coimbatore is the second largest in the country. This University performs the triple function of teaching, research and extension with the main focus of uplifting the farming community and promoting the economy of the State. This University is the fore-runner in establishing centres of excellence with the main aim of carrying out inter-disciplinary research. The Centre for Agricultural and Rural Development Studies is the first of this kind established in 1979 to look into the problems of rural/agricultural development in a holistic manner. This Centre encompasses the Departments of Agricultural Economics, Agricultural Extension and Languages Communication. As a component of CARDS, Department of Agricultural Economics is one of the leading departments in the country. It received financial support from international organisations like Ford Foundation, International Food Policy Research Institute, International Rice Research Institute, Winrock International Institute, etc. which enabled development of staff and enhanced their research and teaching capabilities. The department also provides the needed framework for policy decisions by the Government of Tamil Nadu. The workshop on PRA was organised by the Department of Agricultural Economics out of the grant received from Ford Foundation to make the scientists and students of this university familiar about PRA and for adoption.

INTERNATIONAL INSTITUTE FOR ENVIRONMENT AND DEVELOPMENT

International Institute for Environment and Development (IIED) is a policy research institute linking environmental concerns with the development needs of resource-poor people in the South and with other global environment and development priorities. The Institute advises decision-makers and raises public awareness on such crucial issues as sustainable agriculture, tropical forestry, human settlements, drylands management, and environmental economics.

The Sustainable Agriculture Programme of IIED promotes and supports the development of socially and environmentally aware agriculture through research, training, advocacy, networking and information dissemination. Collaborative research projects are aimed at identifying the constraints and potentials of the livelihood strategies of the Third World poor who are affected by ecological, economic and social change. The refinement and application of Participatory Rural Appraisal (PRA) methods is an area of special emphasis. The Programme supports the exchange of field experiences and research through RRA Notes, aimed at practitioners of Rapid Participatory Rural Appraisal, and the Gatekeeper Series of briefing papers aimed at policy makers.

Tamil Nadu Agricultural University
Coimbatore 641 003
Grams FARMVAR
Telephone: 091-0422-41222
Telex: 855-369 TNAU IN G
Fax: 091-0422-41 672

IIED
3 Endsleigh Street
London WC1H 0DD
Telephone: 071-388 2117
Fax: 071-388 2826
Telex: 261 681 EASCAN